# HUMIDITY / DEW POINT / MOISTURE IN OIL / CARBON DIOXIDE / OXYGEN / BAROMETRIC PRESSURE / WIND

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# Welcome to Vaisala Knowledge eNewsletter

OVERVIEW

## Update your facts

Get the latest news about leading edge technology. Find out more about our existing application solutions, instrumentation and measurement practices.

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## HVAC Measurement Spotlight

Learn about environmental measurement in HVAC systems. These articles deal with topics such as demand control ventilation, indoor air quality and good measurement practices. eNewsletters are available in English, German, French, and Chinese.

## Life Science Spotlight

Get information about instrumentation and measurement in controlled environments such as cleanrooms & dryrooms, laboratories, incubators, environmental test chambers, warehouses and other critical environments. Topics include humidity monitoring in cleanrooms or test chambers, $CO_2$ monitoring in incubators and more. eNewsletters are available in English, German, French, Chinese, and Japanese.

## Industrial Measurement Spotlight

Industrial processes such as air drying, lubricating oil management, and power production require rigorous measurements in extreme conditions. These articles deal with topics such as measuring moisture in oil, compressed air quality, and more. eNewsletters are available in English, German, French, Chinese, and Japanese.

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Be one of the first to know about new instruments, new application solutions and new company developments at Vaisala. eNewsletters are available in English, German, French, Chinese, and Japanese.

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*We at Vaisala have always valued the opportunity to push ourselves and our products to a higher level for the benefit of our customers. Our new strategy nurtures this opportunity, allowing us to focus on customers who operate in tightly controlled and demanding areas in the chosen industrial applications introduced in this catalog. We are confident that concentrating Vaisala's product and business development efforts on these areas will result in the overall success of our customers.*

*The very core of Vaisala still is our unique devotion to products: the stability, reliability and performance that we have always been known and recognized for. With over 70 years of experience, close to 30 offices worldwide and thousands of customers in over 120 countries, Vaisala is an esteemed leader in innovating, manufacturing and servicing high-quality instruments and systems. Our products have been designed to meet the customers' measurement needs in the most demanding industrial processes and controlled environments.*

*This catalog introduces Vaisala's measurement instrument offering for industrial customers. Our professional sales force all over the world is at your service, ready to help you choose just the right solution for your specific measurement needs.*

*I wish you every success with your business – we are at your service.*

*Kenneth Forss*
*Executive Vice President*
*Controlled Environment*
*Vaisala*

Go to www.vaisala.com for the latest updates and other product news.



# Vaisala – at your service

## Solutions to HVAC&R measurement needs

Vaisala serves building automation customers in a variety of HVAC&R measurement needs, providing the best solutions for energy optimization, Indoor Air Quality (IAQ) and Demand Controlled Ventilation (DCV)in diverse and demanding environments. Whether you are an OEM, integrator, contractor, or responsible for facility HVAC management, we have an answer to your specific business needs. See Building Automation offering, page 6.

## Efficiency and productivity in controlled environments

Our cleanrooms and chambers group can help you increase the efficiency and productivity of your operations in controlled environments. Whatever the industry – life science, food, microelectronics, automotive, you name it – cleanrooms & dryrooms, laboratories, incubators, environmental test chambers, warehouses and various other critical environments all benefit from Vaisala's solutions that minimize downtime and maximize yield. See Cleanrooms and Chambers offering, pages 7-8.

## Improved industrial processes

Many industries, such as power, pharmaceutical, marine and plastics industries, benefit from the wide range of Vaisala's measurement instruments. Accurate, stable and reliable measurements can improve your industrial processes, energy efficiency and end-product quality. Applications in which Vaisala measurement instruments and our excellent services help our customers include e.g. monitoring the quality of compressed air, lubricating and transformer oils, as well as controlling various drying processes . See Targeted Industrial Applications offering, pages 8-9.

## A job well done

In any industrial environment, installing the best quality solutions – on time and on budget – can pose a real challenge. By drawing on our application knowledge and product expertise you can always rely on getting just the right solution for your needs.

Vaisala's offering ranges from lightweight, hand-held instruments and OEM models to configurable fixed transmitters designed to meet the most stringent of demands. The standard delivery time for a configured product is three business days. For re-calibration, our regional Service Centers offer express services. See Service offering, pages 148-157.

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# HMT330 Series Humidity and Temperature Transmitters for demanding humidity measurement

*The HMT330 transmitter family has the solution for demanding industrial humidity measurements.*

## Features/Benefits

- Six models for demanding industrial applications
- Full 0 ... 100 %RH measurement, temperature range up to +180 °C (+356 °F) (depending on model)
- Pressure tolerance up to 100 bar (depending on model)
- Next generation Vaisala HUMICAP® Sensor for excellent accuracy and stability
- Graphical display of measurement trends and over four-year history
- Multilingual user interface
- Excellent performance in harsh chemical concentrations
- Corrosion resistant IP65 housing
- NIST traceable (certificate included)
- Analog outputs, WLAN/LAN

The Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMT330 is designed for demanding industrial applications where stable measurement and wide customization is important.

## Vaisala HUMICAP® performance

The HMT330 series incorporates Vaisala's 30 years of experience in industrial humidity measurement. An updated, even more stable and chemical resistant HUMICAP® sensor is available, next to the proven reliable and accurate sensor.

## Chemical purge minimizes effects of contaminants

In environments with high concentrations of chemicals and cleaning agents, chemical purge helps to maintain measurement accuracy between calibration intervals.

Chemical purge involves heating the sensor to remove harmful chemicals. The function can be initiated manually or programmed to occur at set intervals.

## Graphical display of history and measurement trends

The HMT330 can be ordered with a large numerical and graphical display, which allows the user to clearly monitor operational data, measurement trends and 1-year measurement history. The optional data logger with real-time clock makes it possible to generate over four years of measured history, and zoom in on any desired time or time frame. The battery backup of the clock guarantees a reliable logging of measured data.

The display alarm allows tracking of any measured parameter, with a freely configurable low and high limit.

## Data collection and (wireless) transfer to PC

The recorded measurement data can be viewed on the display or transferred to a PC with Microsoft Windows® software. The transmitter can also be connected to a network with an optional (W)LAN interface, which enables a (wireless) Ethernet connection. A USB-RJ45 cable makes it easy to connect the service port of the HMT330 to a PC.

## Many ways to install and versatile outputs

Mains and DC power options, and several mounting accessories make the instrument easy to install.

The HMT330 can have up to three analog outputs. Isolated galvanic power supply and analog outputs are also available. For serial interface the USB connection, RS232 and RS485 can be used.

## Flexible calibration

The HMT330 instruments are calibrated at six humidity points at the factory. A quick, one-point field calibration can be performed with the hand-held HM70 meter. A two-point calibration can be performed with the HMK15 salt bath calibrator in a controlled environment. The transmitter can be sent to Vaisala for recalibration. Accredited calibrations and maintenance contracts are also available.

# Technical data

## Performance

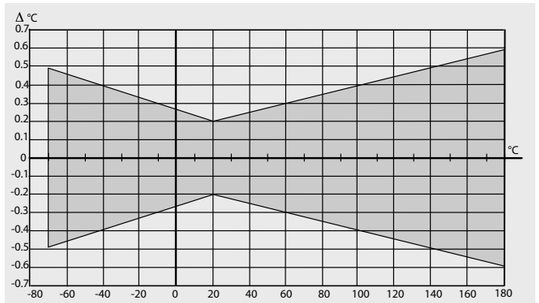
RELATIVE HUMIDITY

| | |
|---|---|
| Measurement range | 0 ... 100 %RH |
| Accuracy (including non-linearity, hysteresis, and repeatability) | |
| with Vaisala HUMICAP® 180 or 180R | for typical applications |
| with Vaisala HUMICAP® 180C or 180RC | for applications with chemical purge/warmed probe |
| at +15 ... +25 °C (59 ... +77 °F) | ±1 %RH (0 ... 90 %) |
| | ±1.7 %RH (90 ... 100 %RH) |
| at -20 ... +40 °C (-4 ... +104 °F) | ±(1.0 + 0.008 x reading) %RH |
| at -40 ... +180 °C (-40 ... +356 °F) | ±(1.5 + 0.015 x reading) %RH |
| Factory calibration uncertainty (+20 °C) | ± 0.6 %RH (0 ... 40 %RH) |
| | ± 1.0 %RH (40 ... 97 %RH) |
| | (Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.) |
| Response time (90 %) at +20 °C (+68 °F) | 8 s / 17 s* with grid filter |
| in still air | 20 s / 50 s* with grid + steel netting filter |
| | 40 s / 60 s* with sintered filter |

* with HUMICAP® 180R or 180RC sensor

TEMPERATURE

| | |
|---|---|
| Accuracy at +20 °C (+68 °F) | ± 0.2 °C (± 0.36 °F) |
| Accuracy over temperature range (measurement range depends on model) | |




| | |
|---|---|
| Temperature sensor | PT 100 RTD 1/3 Class B IEC 751 |

**Other variables** available (depends on model)
dewpoint temperature, mixing ratio, absolute humidity, wet bulb temperature, enthalpy, water vapor pressure

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 10 ... 35 VDC, 24 VAC |
| with optional power supply module | 100 ... 240 VAC, 50/60 HZ |
| Power consumption at +20 °C ($U_{in}$ 24 VDC) | |
| RS-232 | max. 25 mA |
| $U_{out}$ 2 x 0 ... 1 V/0 ... 5 V/0 ... 10 V | max. 25 mA |
| $I_{out}$ 2 x 0 ... 20 mA | max. 60 mA |
| display and backlight | + 20 mA |
| during chemical purge | max. 110 mA |
| during probe heating (HMT337) | + 120 mA |
| Analog outputs (2 standard, 3rd optional) | |
| current output | 0 ... 20 mA, 4 ... 20 mA |
| voltage output | 0... 1 V, 0... 5 V, 0... 10 V |
| Accuracy of analog outputs at +20 °C | ±0.05% full scale |
| Temperature dependence of the analog outputs | ±0.005%/°C full scale |
| External loads | |
| current outputs | $R_L$ < 500 ohm |
| 0 ... 1 V output | $R_L$ > 2 kohm |
| 0 ... 5 V and 0 ... 10 V outputs | $R_L$ > 10 kohm |
| Max. wire size | 0.5 mm² (AWG 20) |
| | stranded wires recommended |
| Digital outputs | RS-232, RS-485 (optional) |
| Service connection | RS-232, USB |
| Relay outputs (optional) | 0.5 A, 250 VAC |
| Ethernet interface (optional) | |
| Supported standards | 10/100Base-T |
| Connector | RJ45 |
| Protocols | Telnet |
| Software support | Vaisala MI70 link |
| WLAN interface (optional) | |
| Supported standards | 802.11b |
| Antenna connector type | RP-SMA |
| Protocols | Telnet |
| Security | WEP 64/128, WPA |
| Software support | Vaisala MI70 link |
| Authentication / Encryption (WLAN) | |
| Open / no encryption | |
| Open / WEP | |
| WPA Pre shared key / TKIP | |
| WPA Pre shared key / CCMP (a.k.a. WPA2) | |
| Optional data logger with real-time clock | |
| Logged parameters | max. three with trend/min/max values |
| Logging interval | 10 sec (fixed) |
| Max. logging period | 4 years 5 months |
| Logged points | 13.7 million points per parameter |
| Battery lifetime | min. 5 years |
| Display | LCD with backlight, graphic trend display of any parameter |
| Menu languages | English, Chinese, Japanese, Spanish, German, French, Swedish, Russian, Finnish |

## Mechanics

| | |
|---|---|
| Cable bushing | M20 x 1.5 for cable diameter |
| Measurement range | 8 ... 11 mm/0.31 ... 0.43" |
| Conduit fitting | 1/2" NPT |
| User cable connector (optional) | M12 series 8-pin (male) |
| option 1 | female plug with 5 m (16.4 ft) black cable |
| option 2 | female plug with screw terminals |
| Probe cable diameter | |
| HMT333 (+80 °C) | 6.0 mm |
| other probes | 5.5 mm |
| Housing material | G-AlSi 10 Mg (DIN1725) |
| Housing classification | IP 65 (NEMA4) |

## Operating environment

| | |
|---|---|
| Operating temperature | |
| for probe | same as measurement range |
| for transmitter body | -40 ... +60 °C (-40 ... 140 °F) |
| with display | 0 ... +60 °C (32 ... 140 °F) |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Industrial Environment |

## Mounting options

*Mounting with Wall Mounting Kit*

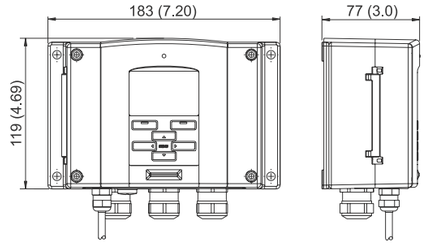
*Mounting with DIN Rail Installation Kit*

*Pole Installation with Installation Kit for Pole or Pipeline*

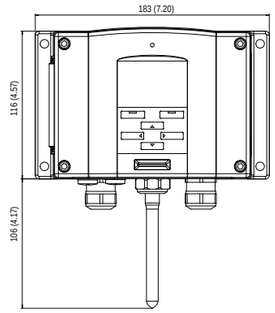
*Mounting Rain Shield with Installation Kit*

## Dimensions

Dimensions in mm (inches)




Transmitter with WLAN antenna




TYPE APPROVED PRODUCT
CERTIFICATE NO.: A-11440

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# HMT331 Humidity and Temperature Transmitter for Demanding Wall-Mounted Applications

*The HMT331 is the state-of-the-art wall-mount humidity instrument.*

*HMT331 Humidity and Temperature Transmitter for demanding wall-mounted applications*

## Features/Benefits

- For temperatures -40 ... +60 °C (-40 ... +140 °F)
- Application examples: cleanrooms, pharmaceutical processes, greenhouses, swimming halls, museums and archives

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT331 is the top-of-the-line wall-mounted transmitter for demanding HVAC and condition monitoring applications.

Compared to regular wall-mounted transmitters, the HMT331 offers, higher measurement performance, better chemical tolerance, advanced graphical display features, more powering options, more output options and a wider variety of output humidity parameters.

## Graphical display of history and measurement trends

The HMT330 series features a large numerical and graphical display, allowing users to easily monitor operational data, measurement trends and one-year measurement history.

The optional data logger with real-time clock makes it possible to generate over four years of measured history, and zoom in on any desired time or time frame.

## Outputs and power supply options for every need

The output options include three analog outputs, RS-232, RS-485, and alarm relays.

The voltage supply range is from 10 to 35 VDC. With an additional module, the transmitter can be connected to all universal mains AC supplies.

The input/output cable can be fed through the back of the transmitter, which is a useful feature, especially for installations in cleanrooms.

## Technical Data

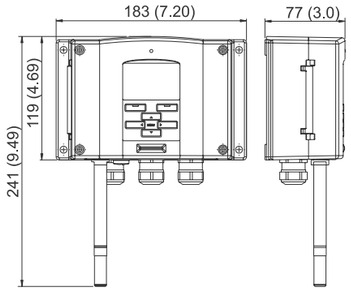
| | |
|---|---|
| Temperature measurement range | -40 ...+60 °C (-40 ...+140 °F) |

## Accessories

| | |
|---|---|
| PC software + cable | 215005 |
| USB-RJ45 Serial Connection Cable | 219685 |
| Connection cable for HM70 | 211339 |
| Wall mounting plate (plastic) | 214829 |
| Pole installation kit | 215108 |
| Rain shield | 215109 |
| DIN rail installation set | 215094 |

## Dimensions

Dimensions in mm (inches)






# HMT333 Humidity and Temperature Transmitter for Ducts and Tight Spaces

*The HMT333 transmitter has a small probe for remote applications.*

*210697 duct installation kit for HMT333 and HMT337.*

For outdoor environments, the DTR502B solar radiation shield provides protection for the probe. The shield can be installed on a pole, a beam or a flat surface.

## Features/Benefits

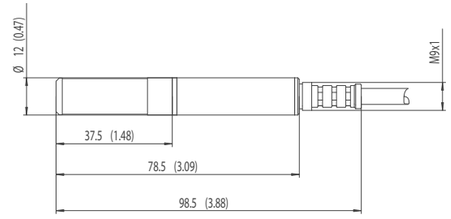
- For remote probe installations in demanding HVAC applications
- For temperatures -40 ... +80 °C (-40 ... +176 °F) or -40 ... +120 °C (-40 ... +248 °F)
- Small thermal mass - fast response to temperature changes
- Application examples: cleanrooms, pharmaceutical processes, greenhouses, environmental chambers

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT333 is a versatile instrument for applicatons where a small remote probe is needed.

## Flexible installation

To install the probe in ducts, channels and through walls, an installation kit is available with an aluminum flange, lead-through piece, and steel support bar.

HMT333 has two probe cable options available, a flexible one that withstands heat up to +80° C, and a durable cable that withstands heat up to +120° C. Both cable options are available in lengths of 2, 5, and 10 meters.




## For moderate humidities and temperatures

The HMT333 is typically used in demanding HVAC applications such as cleanrooms, pharmaceutical processes, and greenhouses, or in processes of moderate temperature.

For environments with continuously high humidity, the HMT337 with a warmed, vapor-tight and stainless steel probe is recommended.

## Technical Data

| | |
|---|---|
| Temperature measurement range | -40 ...+80 °C (-40 ...+176 °F) or -40 ...+120 °C (-40 ...+248 °F) |

## Accessories

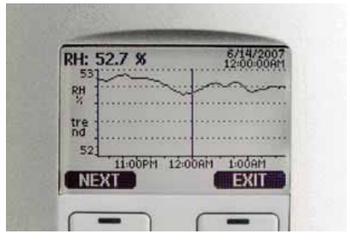
| | |
|---|---|
| Duct installation kit | 210697 |
| Cable gland | HMP247CG |
| PC software + cable | 215005 |
| USB-RJ45 Serial Connection Cable | 219685 |
| Connection cable for HM70 | 211339 |
| Wall mounting plate (plastic) | 214829 |
| Pole installation kit | 215108 |
| Rain shield | 215109 |
| Solar radiation shield | DTR502B |
| DIN rail installation set | 215094 |

## Dimensions

Dimensions in mm (inches)

# HMT334 Humidity and Temperature Transmitter for High Pressure and Vacuum Applications

*The HMT334 is ideal for permanent installations into pressurized or vacuum processes.*




*The display shows measurement trends and over four-year real time measurement history.*

## Features/Benefits

- For pressures up to 100 bar and vacuum applications
- For temperatures -70 ... +180 °C (-94 ... +356 °F)
- ISO and NPT threads available
- Application example: test chambers

## Technical Data

| | |
|---|---|
| Temperature measurement range | -70 ...+180 °C (-94 ...+356 °F) |
| Operating pressure | 0 ... 10 MPa (0 ... 100 bar) |

## Accessories

| | |
|---|---|
| Fitting body ISO M22 x 1.5 | 210697 |
| Fitting body NPT 1/2" | 17225 |
| PC software + cable | 215005 |
| USB-RJ45 Serial Connection Cable | 219685 |
| Connection cable for HM70 | 211339 |
| Wall mounting plate (plastic) | 214829 |
| Pole installation kit | 215108 |
| Rain shield | 215109 |
| DIN rail installation set | 215094 |

## Dimensions

Dimensions in mm (inches)

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT334 is designed to measure humidity in pressurized spaces or vacuum chambers. Each probe is tested to ensure a gas and vacuum tight installation.

### Vaisala HUMICAP® performance

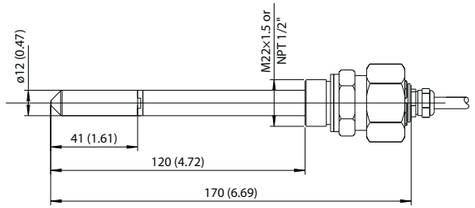
The HMT334 incorporates Vaisala's more than 30 years of experience in industrial humidity measurement. The sensor provides accurate and reliable measurement and is immune to particulate contamination and most chemicals.

### Graphical display of measurement trends and real time history

The HMT330 series features a numerical and graphical display. The user can easily monitor operational data, measurement trends and up to one-year history.

The optional data logger with real-time clock makes it possible to generate more than four years of measured history, and zoom in on any desired time or time frame.

Using a serial line, the measurement data can be transferred to a PC where it can be further processed and copied to other programs.






# HMT335 Humidity and Temperature Transmitter for High Temperatures

*The HMT335 has a robust stainless steel probe ideal for high flow rates in hot processes.*

*The installation flange allows an adjustable installation depth for the probe.*

## Features/Benefits

- For temperatures -70 ... +180 °C (-94 ... +356 °F)
- Long metal probe head
- Stainless steel installation flange available
- Adjustable installation depth
- Application example: hot drying processes

## Technical Data

| | |
|---|---|
| Temperature measurement range | -70 ...+180 °C (-94 ...+356 °F) |

## Accessories

| | |
|---|---|
| Mounting flange | 210696 |
| PC software + cable | 215005 |
| USB-RJ45 Serial Connection Cable | 219685 |
| Connection cable for HM70 | 211339 |
| Wall mounting plate (plastic) | 214829 |
| Pole installation kit | 215108 |
| Rain shield | 215109 |
| DIN rail installation set | 215094 |

## Dimensions

Dimensions in mm (inches)

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT335 has a long stainless steel probe designed for high temperatures.

### Robust probe ideal for high flow rates

The HMT335 is ideal for duct measurements as the probe tolerates mechanical stress and withstands high flow rates. The HMT335 can be used, for example, in a hot drying process.

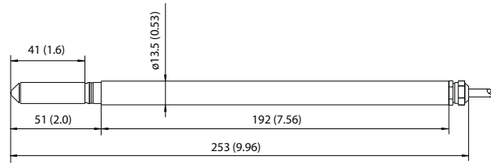
### Graphical display of history and measurement trends

The HMT335 features a numerical and graphical display. The user can easily monitor measurement operational data, measurement trends and one-year measurement history.

The optional data logger with real-time clock makes it possible to generate more than four years of measured history, and zoom in on any desired time or time frame.

### Vaisala HUMICAP® performance

The sensor provides accurate and reliable measurement and is immune to particulate contamination and most chemicals.



# HMT337 Humidity and Temperature Transmitter for High Humidity Applications

*The HMT337 is the ideal transmitter for the most demanding process and meteorological measurements.*

*Duct installation kit*

**Features/Benefits**

- For high-humidity applications in industry and meteorology
- Warmed probe for superior performance in condensing environments
- Small, stainless steel, vapor-tight remote probe
- For temperatures -70 ... +180 °C (-94 ... +356 °F)

## Technical Data

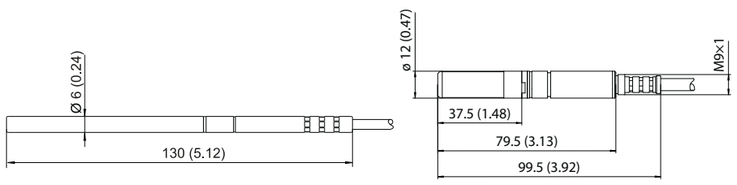
| | |
|---|---|
| Temperature measurement range | -70 ...+180 °C (-94 ...+356 °F) |

## Accessories

| | |
|---|---|
| Cable gland and AGRO | HMP247CG |
| Duct installation kit (RH probe) | 210697 |
| Duct installation kit (T probe) | 215003 |
| Swagelok fittings (NPT and ISO) for both RH and T probes | |
| Solar radiation shield | DTR502B |
| Meteorological inst. kit | HMT330MIK |
| PC software + cable | 215005 |
| USB-RJ45 Serial Connection Cable | 219685 |
| Connection cable for HM70 | 211339 |
| Wall mounting plate (plastic) | 214829 |
| Pole installation kit | 215108 |
| Rain shield | 215109 |
| DIN rail installation set | 215094 |

## Dimensions

Dimensions in mm (inches)




The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT337 is delivered in one of three configurations:

- Basic: non-warmed probe for moderate humidities
- With a warmed probe: for near-condensing conditions and dew point measurement
- With a warmed probe and an additional temperature sensor: for near-condensing conditions and relative humidity measurement

### True humidity readings in conditions of condensation

The Vaisala unique warmed probe provides fast and reliable measurement in environments where humidity is near saturation. The warming prevents condensation from forming on the sensor.

As the probe is warmed, the humidity level inside it stays below the ambient level. With accurate temperature measurement, the ambient dewpoint can be calculated precisely.

If the relative humidity value is needed, an additional temperature sensor is used. The measured ambient temperature provides the compensation for calculating relative humidity and other humidity parameters.

### Many ways to install

A tight installation through a process wall can be achieved with Swagelok® fittings. Meteorological installation kits for outdoor installations and duct installation kits are also available.



# HMT338 Humidity and Temperature Transmitter for Pressurized Pipelines

*The HMT338 is ideal for installations in pressurized processes where the probe needs to be removed while the is running.*

**Features/Benefits**

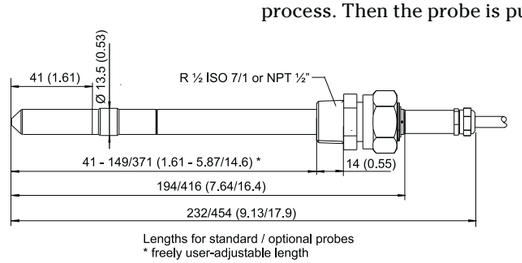
- Installed through ball valve – can be inserted and removed while the process is running
- Adjustable probe depth
- Pressure tolerance 40 bar
- For temperatures -70 ... +180 °C (-94 ... +356 °F)
- Two probe lengths available

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT338 is designed for pressurized processes.

### Insert or remove probe while the process is running

With “hot tapping”, the probe is inserted directly into the process while it is running, without the need for venting or lowering the process pressure.

The probe is screwed into a ball valve assembly that has been fixed to the process pipe or wall. The adjustable hex nut is hand-tightened to temporarily hold the probe to the process. Then the probe is pushed down to the appropriate depth. The hex nut is tightened with a wrench to lock the probe in its place. Hot tapping is possible in pressures up to 10 bar.




### Graphical display of history and measurement trends

From the display, the user can easily monitor operational data, measurement trends and one-year measurement history.

The optional data logger with real-time clock makes it possible to generate more than four years of measured history, and zoom in on any desired time or time frame. The battery backup of the real-time clock guarantees a reliable logging of measured data.

### Vaisala HUMICAP®

The HMT338 incorporates Vaisala’s more than 30 years of experience in industrial humidity measurement. The sensor provides accurate and reliable measurement and is immune to particulate contamination and most chemicals.

## Technical Data

| | |
|---|---|
| Temperature measurement range | -70 ...+180 °C (-94 ...+356 °F) |
| Operating pressure | 0 ...4MPa (0 ...40 bar) |

## Accessories

| | |
|---|---|
| Ball valve set | BALLVALVE-1 |
| Pressure fitting ISO 1/2 to NPT 1/2 | 210662 |
| PC software + cable | 215005 |
| USB-RJ45 Serial Connection Cable | 219685 |
| Connection cable for HM70 | 211339 |
| Wall mounting plate (plastic) | 214829 |
| Pole installation kit | 215108 |
| Rain shield | 215109 |
| DIN rail installation set | 215094 |

## Dimensions

Dimensions in mm (inches)

VAISALA

www.vaisala.com

# HMT360 Series Intrinsically Safe Humidity and Temperature Transmitters

*The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT361 wall mount transmitter, shown with six probe options, is designed specifically for hazardous and explosive environments.*

## Features/Benefits

- Measures humidity and temperature, outputs also dewpoint, mixing ratio, absolute humidity and wet bulb temperature
- Safe operation with the entire transmitter in hazardous areas: Division 1 and 2 (USA, Canada), Categories 1G / Zone 0 and 1D / Zone 20 with protection cover (EU)
- Intrinsically safe
- Designed for harsh conditions
- Vaisala HUMICAP® Sensor features high accuracy, excellent long-term stability, and negligible hysteresis
- Six probe options
- Temperature range between -40 ... +180°C (-40 ... +356°F) depending on the probe option
- NIST traceable (certificate included)

The Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMT360 are the ideal solution for measuring humidity in hazardous areas. They operate safely and reliably even in the most hazardous classifications. The HMT360 transmitters' proven performance and technology conform with rigorous international standards.

## Intrinsically safe

The entire HMT360 transmitter can be installed directly in explosive areas. It can withstand continuous exposure to potentially explosive environments that contain flammable gases or dust.

## Customized configuration

Due to the microprocessor based electronics, options and accessories, the HMT360 series is truly flexible.

Customers may specify the transmitter configuration when ordering the instrument, however changes in configuration can also easily be made in the field.

## Interchangeable probes

The HMT360 offers six probe options for various applications:

| | |
|---|---|
| HMP361 | - wall mount |
| HMP363 | - confined spaces |
| HMP364 | - pressurized spaces |
| HMP365 | - high temperature |
| HMP367 | - high humidity |
| HMP368 | - pressurized pipelines |

The interchangeable probes enable fast and easy removal or re-installation when required. Calibration, for example, is easy to perform due to the modular structure. All calibration coefficients are included in the probe unit itself, which means that probes can be switched between transmitter bodies without losing the accuracy.

## Optimized sensors

In addition to the standard Vaisala HUMICAP® Sensor, an application specific, very chemically durable sensor is also available.

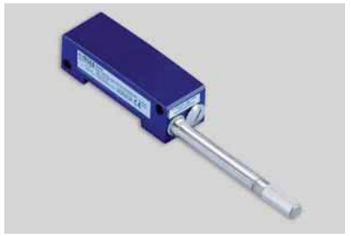
## Long-term solution

The HMT360 transmitters are an investment; their rugged design, combined with trouble-free operation, ensure a long-term solution for monitoring humidity and dewpoint in explosive environments.

Customized calibration and maintenance contracts for the HMT360 series are available on request.



# Interchangeable Probes for HMT360 Intrinsically Safe Humidity and Temperature Transmitter



*The HMP361 probe in this picture has a stainless steel netting filter.*

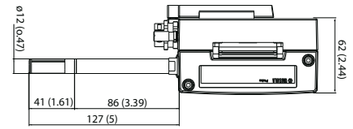
### Technical Data

**HMP361 for wall mounting**

| | |
|---|---|
| Temperature range | -40 ...+60 °C (-40 ...+140 °F) |
| Probe diameter | 12 mm |

### Dimensions

Dimensions in mm (inches)



*The HMP363 probe is small and fits into tight spaces. This one is connected with a teflon cable.*

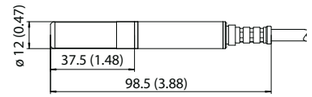
### Technical Data

**HMP363 for confined spaces**

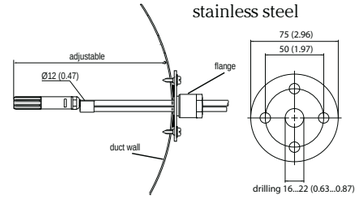
| | |
|---|---|
| Temperature range with | |
| teflon cable | -40 ...+120 °C (-40 ...+248 °F) |
| rubber cable | -40 ...+80 °C (-40 ...+176 °F) |
| Probe cable length | 2,5 or 10 meters |
| Probe diameter | 12 mm |
| Installation | |
| Duct installation kit | 210697 |
| Cable Gland M20x1.5 with splitting seal | HMP247CG |
| Swagelok for 12mm probe, 1/2" NPT thread | SWG12NPT12 |

### Dimensions

Dimensions in mm (inches)




Installation kit for duct mounting




Installation flange: aluminum or stainless steel

*The HMP364 probe is designed for measurement in pressurized spaces or vacuum chambers.*

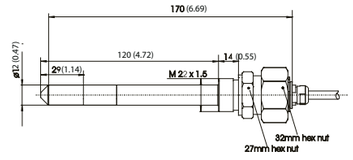
### Technical Data

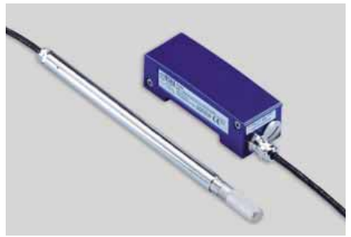
**HMP364 for high pressure**

| | |
|---|---|
| Temperature range | -40 ...+180 °C (-40 ...+356 °F) |
| Pressure range | 0 ... 10 MPa |
| Probe cable length | 2,5 or 10 meters |
| Probe diameter | 12 mm |
| Fitting body M22x1.5 | 17223 |
| Fitting body NPT1/2 | 17225 |

### Dimensions

Dimensions in mm (inches)





*The HMP365 probe is designed for high temperature environments.*

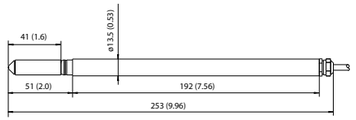
## Technical Data

### HMP365 for high temperature

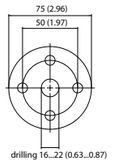
| | |
|---|---|
| Temperature range | -40 ...+180 °C (-40 ...+356 °F) |
| Probe cable length | 2,5 or 10 meters |
| Probe diameter | 13.5 mm |
| Installation | |
| Mounting flange | 210696 |
| Cable Gland M20x1.5 with splitting seal | HMP247CG |

## Dimensions

Dimensions in mm (inches)




Installation flange: stainless steel



*The HMP367 probe is constructed to be installed in environments with high humidities.*

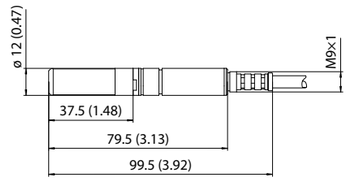
## Technical Data

### HMP367 for high humidities

| | |
|---|---|
| Temperature range | -40 ...+180 °C (-40 ...+356 °F) |
| Probe cable length | 2,5 or 10 meters |
| Probe diameter | 12 mm |
| Installation | |
| Duct installation kit | 210697 |
| Cable Gland M20x1.5 with splitting seal | HMP247CG |
| Swagelok for 12mm probe, 3/8" ISO thread | SWG12ISO38 |
| Swagelok for 12mm probe, 1/2" NPT thread | SWG12NPT12 |

## Dimensions

Dimensions in mm (inches)



*The HMP368 probe enables flexible installation in pressurized pipelines.*

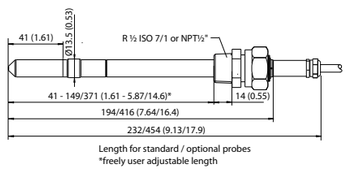
## Technical Data

### HMP368 for pressurized pipelines

| | |
|---|---|
| Temperature range | -40 ...+180 °C (-40 ...+356 °F) |
| Pressure range | 0 ...4 MPa |
| Probe cable length | 2,5 or 10 meters |
| Probe diameter | 13.5 mm/12 mm |
| Two probe lenghts available. | |
| Installation | |
| Fitting body ISO1/2 solid structure | DRW212076SP |
| Fitting body NPT1/2 solid structure | NPTFITBODASP |
| Ball valve ISO 1/2 with welding joint | BALLVALVE-1 |

## Dimensions

Dimensions in mm (inches)






# Technical data

## Performance

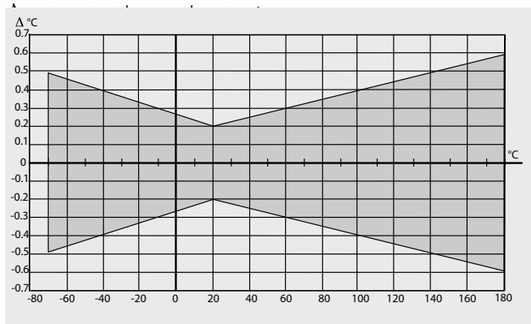
RELATIVE HUMIDITY

| | |
|---|---|
| Measurement range | 0 ... 100 %RH |
| Accuracy (including non-linearity, hysteresis, and repeatability) | |
| with Vaisala HUMICAP® 180 or 180R | for typical applications |
| at +15 ...+25 °C (59 ...+77 °F) | ± 1.0 %RH (0 ...90 %RH) |
| | ±1.7 %RH (90 ... 100 %RH) |
| at -20 ...+40 °C (-4 ...+104 °F) | ±(1.0 + 0.008 x reading) %RH |
| at -40 ...+180 °C (-40 ...+356 °F) | ± (1.5 +0.015 x reading) %RH |
| with Vaisala HUMICAP® 180$_L$2 | for application with demanding chemical environment |
| at -10...+40 °C (14 ...+104 °F) | ± (1.0 + 0.01 x reading) %RH |
| at -40 ...+180 °C (-40 ...+356 °F) | ± (1.5 + 0.02 x reading) %RH |
| Factory calibration uncertainty (+20 °C) | ± 0.6 %RH (0 ...40 %RH) |
| | ± 1.0 %RH (40 ...97 %RH) |
| | (Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.) |
| Response time (90 %) at +20 °C (+68 °F) in still air | |
| with grid filter | 8 s / 17 s* |
| with grid + steel netting filter | 20 s / 50 s* |
| with sintered filter | 40 s / 60 s* |

* with HUMICAP® 180R sensor

TEMPERATURE

| | |
|---|---|
| Measurement range | -40 ...+180 °C (-40 ...+356 °F) (depends on selected probe) |
| Typical accuracy of electronics at +20 °C (+68 °F) | ±0.2 °C (0.36 °F) |
| Typical temparature dependence of electronics | 0.005 °C/°C (0.005 °F/°F) |
| Sensor | Pt 1000 RTD 1/3 Class B IEC 751 |




OTHER VARIABLES

| | |
|---|---|
| Optionally available | dewpoint temperature, mixing ratio, absolute humidity, wet bulb temperature. |

## Operating environment

| | |
|---|---|
| Temperature range | |
| operating temp. range for electronics | -40 ...+60 °C (-40 ...+140 °F) |
| with display | -20 ...+60 °C (-4 ...+140 °F) |
| storage | -40 ...+70 °C (-40 ...+158 °F) |
| Pressure range | see probe specifications |

Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial Environment.
NOTE! IEC 1000-4-5 complies only when using external EXi approved surge arrester in the safe area.

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 12 ...28 V |
| with serial port (service mode) | 15 ...28 V |
| Analog outputs | two-wire 4 ...20 mA, one standard, one optional |
| Typical accuracy of analog outputs at +20 °C | ±0.05% full scale |
| Typical temperature dependence of analog outputs | 0.005% / °C (0.005% / °F) full scale |
| Analog outputs | connection via safety barriers |
| RS232C serial output for service use | connector type RJ45 |
| Display | two-line LCD |

## Mechanics

| | |
|---|---|
| Connections | screw terminals, 0.33...2.0 mm 2 wires (AWG 14-22) |
| Cable bushings | For 7.5...12mm or 10...15mm cable diameters (M20) |
| Conduit fitting | NPT 1/2" (M20) |
| Housing material | G-AlSi$_1$0Mg (DIN 1725) |
| Housing classification | IP66 (NEMA 4X) |
| Housing weight | 950 g |

## Options and accessories

| | |
|---|---|
| Duct installation kit (for HMP363/367) | 210697 |
| Mounting flange (for HMP365) | 210696 |
| Ball valve ISO 1/2 with welding joint (for HMP368) | BALLVALVE-1 |
| pressure range at +20 °C (+68 °F): | 0 ...20 bar (0 ...290 psia) (during installation max. 10 bar (145 psia) |
| Calibration adapter for HMK15 | 211302 |
| Serial interface cable for PC connectors RJ45 - D9 female | 25905ZZ |
| Galvanic isolator | 212483 |
| Zener barrier (USA & Canada) | 210664 |
| Protection cover (for use in the presence of combustible dust, ATEX) | 214101 II 1 D IP65 T = 70 °C |

## Classification with current outputs

EUROPE / VTT

| | |
|---|---|
| EU (94/9/EC, ATEX100a) | II 1 G Ex ia IIC T4 Ga |
| | VTT 09 ATEX 028 X issue No: 1 |
| Safety factors | $U_i$ = 28 V, $I_i$ = 100 mA, $P_i$ = 700 mW |
| | $C_i$ = 1 nF, $L_i$ negligibly low |

Environmental specifications

| | |
|---|---|
| $T_{amb}$ | -40 ... +60 °C (-40 ... +140 °F) |
| $P_{amb}$ | 0.8 ... 1.1 bar |
| Dust classification (with protection cover) | II 1 D (IP65 T=70 °C) |
| | VTT 04 ATEX 023X |

USA (FM)

| | |
|---|---|
| | Classes I, II, III, Division 1, Groups A-G and |
| | Division 2, Groups A-D, F and G |
| | FM Project ID: 3010615 |
| Safety factors: | Vmax = 28 VDC, $I_{max}$ = 100 mA, |
| | $C_i$ = 1 nF, $L_i$ = 0, $P_i$ = 0.7 W, $T_{amb}$ = 60 °C(140 °F), T5 |

JAPAN (TIIS)

| | |
|---|---|
| | Ex ia IIC T4 |
| | Code number: TC17897 |
| Safety factors: | $U_i$ = 28 VDC, $I_i$ = 100 mA, $C_i$ = 1 nF, |
| | $P_i$ = 0.7 W, $L_i$ = 0, $T_{amb}$ = 60 °C (140 °F) |

CANADA (CSA)

| | |
|---|---|
| Class I | Division 1 and Division 2, Groups A, B, C, D; |
| Class II | Division 1 and Division 2, Groups G and |
| | Coal Dust; |
| Class III | CSA File No: 213862 0 000, CSA Report: 1300863 |
| Safety factors: | $T_{amb}$ = 60 °C, T4, |
| | Intrinsically safe when connected as per |
| | Installation Drawing DRW213478. |

CHINA (PCEC)

| | |
|---|---|
| | Ex ia II CT4 |
| | Certificate No. CE092145 |
| | Standard GB3836.1-2000 and GB3836.4-2000 |

IECEx (VTT)

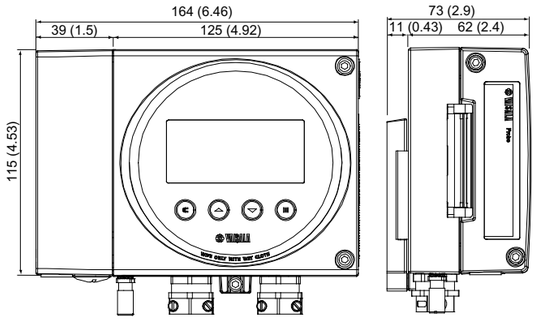
| | |
|---|---|
| | Ex ia IIC T4 Ga |
| | IECEx VTT 09.0002x issue No: 1 |
| Safety factors | $U_i$ = 28 V, $I_i$ = 100 mA, $P_i$ = 700 mW |
| | $C_i$ = 1 nF, $L_i$ negligibly low |

Environmental specification

| | |
|---|---|
| $T_{amb}$ | -40 ... +60 °C (-40 ... +140 °F) |
| $P_{amb}$ | 0.8 ... 1.1 bar |

## Dimensions

Dimensions in mm (inches)




## Accessories

| | | HMT361 | HMT363 | HMT364 | HMT365 | HMT367 | HMT368 |
|---|---|---|---|---|---|---|---|
| **Accessory** | **part number** | | | | | | |
| Ball valve ISO 1/2 with welding joint | BALLVALVE-1 | | | | | | √ |
| Cable Gland M20 x 1.5 with splitting seal | HMP247CG | | √ | | √ | √ | |
| Duct installation kit | 210697 | | √ | | | √ | |
| Fitting body ISO1/2 solid structure | DRW212076SP | | | | | | √ |
| Fitting body M22 x 1.5 | 17223 | | | √ | | | |
| Fitting body NPT1/2 | 17225 | | | √ | | | |
| Fitting body NPT1/2 solid structure | NPTFITBODASP | | | | | | √ |
| Mounting flange | 210696 | | | | √ | | |
| Swagelok for 12mm probe, 1/2" NPT thread | SWG12NPT12 | | √ | | | √ | |
| Swagelok for 12mm probe, 3/8" ISO thread | SWG12ISO38 | | √ | | | √ | |

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# HMT310 Humidity and Temperature Transmitter

*The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT310 models (from left to right): HMT313, HMT317, HMT314, HMT318, HMT315 and HMT311.*

## Features/Benefits

- Next-generation Vaisala HUMICAP® Sensor for excellent accuracy and stability
- Full 0 ... 100 %RH measurement, temperature range up to +180 °C (depending on model)
- Small size, easy to integrate
- Insensitive to dust and most chemicals
- NIST traceable

## Reliable Vaisala HUMICAP® technology

The HMT310 incorporates the latest-generation Vaisala HUMICAP® Sensor. The Vaisala HUMICAP® Sensor is a capacitive thin-film polymer sensor. It features high accuracy, excellent long-term stability and negligible hysteresis. It is insensitive to dust, particulate dirt and most chemicals.

## Several outputs, one connector

The HMT310 is powered up with 12 ... 35 VDC. It has two analog outputs and an RS-232 serial output. The output signal and the supply power travel in the same cable, the only cable connected to the unit.

## Chemical purge

Chemical purge helps to maintain measurement accuracy between calibraton intervals and it involves heating the sensor to remove harmful chemicals. The function can be initiated manually or programmed to occur at set intervals.

## Optional functions

The following optional functions are available: several probes for various applications, calculated humidity quantities, different mounting kits, sensor protection options and probe cable lengths, warmed probe and sensor heating for high humidity conditions (HMT317), and chemical purge for applications risking an interference with chemicals in the measuring environment.

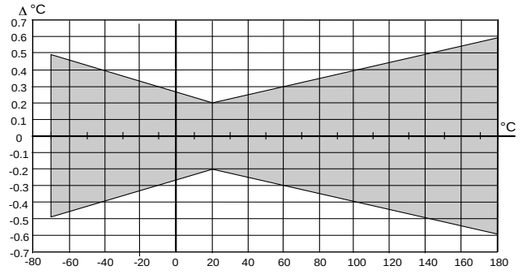


# Technical data

## Measured values

| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Sensor | |
| Vaisala HUMICAP®180R | typical applications |
| Vaisala HUMICAP®180RC | applications with chemical purge and/or warmed probe |
| Accuracy (incl. non-linearity, hysteresis and repeatability) at a temperature range of | |
| +15 ... +25 °C | ±1 %RH (0 ... 90 %RH) |
| | ±1.7 %RH (90 ... 100 %RH) |
| -20 ... +40 °C | ±(1.0 + 0.008 x reading) %RH |
| -40 ... +180 °C | ±(1.5 + 0.015 x reading) %RH |
| Factory calibration uncertainty (+20 °C) | ±0.6 %RH (0 ... 40 %RH)* |
| | ±1.0 %RH (40 ... 97 %RH)* |
| ** Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.* | |
| Response time (90 %) at +20 °C in 0.1 m/s air flow | 17 s with grid filter |
| | 50 s with grid and steel, netting filter |
| | 60 s with sintered filter |
| TEMPERATURE | |
| HMT311 | -40 ... +60 °C (-40 ... +140 °F) |
| HMT313 | -40 ... +80 °C (-40 ... +176 °F) |
| | or -40 ... +120 °C (-40 ... +248 °F) |
| HMT314, HMT315, HMT317, HMT318 | -70 ... +180 °C (-94 ... +356 °F) |

Accuracy over temperature range (see graph below)




| | |
|---|---|
| Typical temperature dependence of electronics | ±0.05 °C/°C (±0.005 °F/°F) |
| Temperature sensor | Pt100 IEC751/3 class B |

## Electrical connections

| | |
|---|---|
| Two analog outputs, selectable and scalable | 0 ... 20 mA or 4 ... 20 mA |
| Typical accuracy of analog output at +20 °C | ±0.05 % full scale |
| Typical temperature dependence of analog output | 0.005 %/°C (0.003 %/°F) of full scale |
| Serial output | RS-232C |
| Connections | M12 8-pole connector with RS-232C, current outputs (two channels) and $U_{in}$ |
| Operating voltage | 12 ... 35 VDC, the maximum operating voltage for a device with sensor heating is 24 VDC |
| Power consumption | 30 mA with RS-232 |
| External load | $R_l$ < 500 Ohm |
| Startup time after powerup | 3 s |

## General

| | |
|---|---|
| Operating temperature range for electronics | -40 ... +60 °C (-40 ... +140 °F) |
| Storage temperature range | -55 .... +80 °C (-67 ... +176 °C) |
| Operating pressure | |
| HMT314 | 0 ... 100 bar |
| HMT318 | 0 ... 40 bar |
| HMT315, HMT317 | vapor tight |
| Transmitter housing material | G-AlSi10Mg |
| Transmitter base material | ABS/PC |
| Housing classification | IP65 |
| Cable feed through alternatives | 8-pole connector with 5 m cable, Female 8-pin connector screw joint for cable diameter 4 ... 8 mm |
| Sensor protection | PPS grid with stainless steel net, PPS grid, Sintered filter Membrane stainless steel filter |

Complies with EMC standard EN61326-1, Industrial environment

Note: When using the current output, the RF field susceptibility level according to standard EN61000-4-3 with a frequency band of 110 ... 165 MHz, is only 3V/m (generic environment) with the specified accuracy.

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# HMT100 Series Humidity and Temperature Transmitter for Demanding HVAC Applications

*HMT100 remote probe and wall mount models.*

## Features/Benefits

- Full 0 ... 100 %RH measurement
- Two-wire loop-powered or three-wire voltage output configurations
- Fixed and remote probe models
- Display available
- Relative humidity, dewpoint, temperature outputs
- Vaisala HUMICAP® sensor
- Interchangeable probe module for minimal maintenance downtime
- Different output scalings
- Compatible with hand-helds HM70 and HMI41 for calibration
- IP65 (NEMA 4) housing
- NIST traceable (certificate included)

The Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMT100 are designed for humidity and temperature monitoring in demanding environments.

Typical applications include stability rooms, HVAC, livestock farms, greenhouses, indoor swimming pools, and outdoor applications.

## Performance

HMT100 incorporates Vaisala HUMICAP® technology that measures relative humidity accurately and reliably. Vaisala HUMICAP® is also resistant to dust and most chemicals.

## Available options

The HMT100 is available as a wall mount or remote probe model with an optional display. For high temperature applications or where space is limited, the remote probe is ideal.

HMT100 can show relative humidity only, dewpoint only, or relative humidity and temperature, or dewpoint and temperature readings.

The probes are interchangeable without having to calibrate or adjust the transmitter.

HMT100 can also be installed outdoors using an installation kit, or directly into an air conditioning channel using a duct installation kit.

## Annual calibration

Calibration is recommended typically at an interval of one year using either the Vaisala HUMICAP® Hand-held Humidity and Temperature Meter HM70 or the Vaisala HUMICAP® Humidity Indicator HMI41.

The accuracy of the instrument can also be checked using the Vaisala Humidity Calibrator HMK15, which is based on saturated salt solutions.

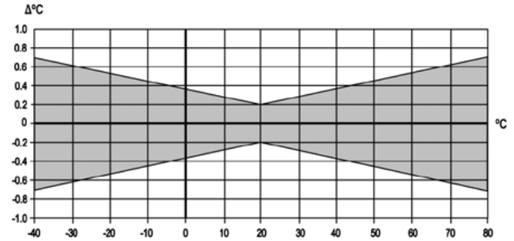


# Technical data

## Performance

| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Accuracy against factory standards including non-linearity, hysteresis, and repeatability | |
| at +15 ... +25 °C (+59 ... +77 °F) | ±1.7 %RH (0 ... 90 %RH)<br>±2.5 %RH (90 ... 100 %RH) |
| at ±0 °C ... +40 °C (+32 ... +104 °F) | ±(1.7 +0.015 x reading) %RH |
| at -40 ... ±0 °C, +40 ... +80 °C (-40 ... +32 °F, +104 ... +176 °F) | ±(2.0+0.025 x reading) %RH |
| Factory calibration uncertainty at +20 °C (+68 °F) | ±1.0 %RH (0 ... 15 %RH)<br>±1.5 %RH (>15 ... 78 %RH) |
| Response time (90 %) at 20 °C in still air | 8 s with plastic grid<br>20 s with membrane filter<br>40 s with sintered filter |
| Humidity sensor | Vaisala HUMICAP® 180 |
| TEMPERATURE | |
| Measurement range | -40 ... +80 °C (-40 ... 176 °F) |
| Accuracy at +20 °C (+68 °F) | ±0.2 °C (±0.36 °F) |

ACCURACY OVER TEMPERATURE RANGE




| | |
|---|---|
| Temperature sensor | Pt1000 IEC 751 1/3 class B |
| DEWPOINT TEMPERATURE (CALCULATED) | |
| Measuring range | -20 ... +80 °C (-4 ... +176 °F) |

## Operating Environment

| | |
|---|---|
| Operating temperature range | |
| transmitter body, no display | -40 ... +60 °C (-40 ... +140 °F) |
| transmitter body, with display | -30 ... +60 °C (-22 ... +140 °F) |
| probe (remote probe only) | -40 ... +80 °C (-40 ... +176 °F) |
| Storage temperature range | -40 ... +60 °C (-40 ... +140 °F) |
| Electromagnetic compatibility | EN61326-1, Industrial Environment |

## Inputs and outputs

| | |
|---|---|
| Two-wire output signal | 4 ... 20 mA |
| External loop load | 10 ... 35 VDC ($R_L$ = 0 ohms)<br>20 ... 35 VDC ($R_L$ = 500 ohms) |
| Voltage output signals | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V<br>(0 ... X V see order form) |
| Supply voltage | 10 ... 35 VDC/24 VAC |
| Current consumption, 35 VDC/24 VAC | max. 12 mA |
| External load | $R_L$ min. 10 kΩ |

## Mechanics

| | |
|---|---|
| Material | |
| Housing | ABS/PC plastic |
| Probe | chrome coated aluminum |
| Mounting plate GM45160 | ABS plastic |
| Housing classification | IP65 (NEMA 4) |
| Sensor protection | |
| Plastic grid | DRW010522 |
| Plastic grid with membrane filter | DRW010525 |
| Sintered stainless steel filter | HM46670SP |
| Connections | screw terminals 0.5 ... 1.5 mm² |
| Probe cable lengths | 3 m, 5 m, 10 m |
| Calibration | with HM70, HMI41,<br>or with internal 11 %RH & 75 %RH buttons |
| Display option | |
| One line fixed variable or changing variables when two variables are ordered | |

## Options and accessories

| | |
|---|---|
| Spare probe | HMP100 |
| Spare extension cable (10 m) | DRW220095 |
| Radiation shield | DTR502B |
| Rain shield with installation kit | 215109 |
| Installation plate | DRW010699 |
| Duct installation kit | 215619 |
| Connection cable for HMI41 | 2591722 |
| Connection cable for HM70 | 211339 |

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# DMW19 Wall Mount Dewpoint Transmitters for Indoor Applications

*Vaisala HUMICAP® Dewpoint Transmitter DMW19 is a compact wall mount dewpoint transmitter.*

*The Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70 is an easy and fast way to confirm the performance of DMW19 on site.*

## Features/Benefits

- Designed for demanding building automation applications and other wall mount indoor applications where dewpoint measurement is needed
- Dewpoint measurement range -20 ... +55 °C (-4...+131 °F)
- Accuracy ±2 °C (±3.6 °F)
- Vaisala HUMICAP® Sensor for excellent accuracy and long-term stability, negligible hysteresis and resistance to dust and most chemicals.
- Electronic, on site, one-point field check with Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70

The wall mount Vaisala HUMICAP® Dewpoint Transmitter DMW19 is designed for use in air conditioning and other indoor wall mount applications where accurate and stable dewpoint measurement is required. DMW19 is an ideal choice for demanding building automation applications where dewpoint is the preferred parameter for humidity measurement.

### Proven Vaisala HUMICAP® Sensor Technology

The operation of DMW19 is based on the proven Vaisala HUMICAP® Sensor. The dewpoint is calculated from relative humidity and temperature. The patented Vaisala HUMICAP® Sensor is insensitive to dust, particulate dirt and most chemicals. This results in high accuracy, excellent long-term stability and negligible hysteresis.

### Easy to install

DMW19 is compact and lightweight. In addition, DMW19 is easy to install and it is suitable for different junction boxes.

### Fast, on-site field check

The accuracy of the transmitter is simple to check on-site using the Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70.

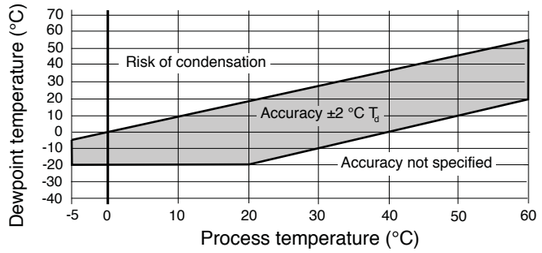
*DMW19 is suitable for demanding building automation and other wall mount indoor dewpoint measurements.*



# Technical data

## Dewpoint temperature

| | |
|---|---|
| Measurement range | -20 ...+55 °C (-4 ...+131 °F) |
| Accuracy | ±2 °C (±3.6 °F) (see graph below) |




*Dewpoint accuracy vs. measurement conditions*

| | |
|---|---|
| Response time | 15 s |
| Humidity sensor | Vaisala HUMICAP® 180 |
| Temperature sensor | Pt 100 IEC 751 1/3 class B |

## Operating environment

| | |
|---|---|
| Operating temperature | -5 ...+60 °C (+23 ...+140 °F) |
| Storage temperature | -40 ...+80 °C (-40 ... 176 °F) |
| Relative humidity | 0 ...95 %RH operating and storage |

## Outputs

| | |
|---|---|
| Analog outputs (scalable) | 4 ...20 mA |
| | 0 ...1 V |
| | 0 ...5 V |
| Resolution for current output | 0.002 mA |
| Resolution for voltage output | 0.3 mV |
| Typical temperature dependence | 0.005 % of span/ °C |

## General

| | |
|---|---|
| Operating voltage with voltage output | 12 ...35 VDC |
| | 11 ...28 VAC |
| Operating voltage with current output | |
| | 20 ...35 VDC / 19 ...28 VAC with RL500 ohm |
| | 17 ...35 VDC / 16 ...28 VAC with RL50 ohm |
| Supply current | 10 mA + load current |
| Load for voltage output | min. 10 kohm |
| Load for current output | max. 500 ohm |
| Connections | screw terminals 0.5 ... 1.5 mm² |
| Housing | ABS plastics |
| Housing colour | NCS-2502-R |
| Housing classification | IP33 |
| Weight | 110 g |

## Operating environment

| | |
|---|---|
| Operating temperature | -5 ...+60 °C (+23 ...+140 °F) |
| Storage temperature | -40 ...+80 °C (-40 ... 176 °F) |
| Relative humidity | 0 ...95 %RH operating and storage |

## Electromagnetic compatibility

Complies with EMC standard EN61326-1, Generic Environment

## Dimensions

Dimensions in mm

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# HMD60/70 Humidity and Temperature Transmitters for ducts in HVAC applications

*Vaisala HUMICAP® Humidity and Temperature Transmitters HMD60 and HMD70 are designed for use in air conditioning applications where accurate and stable control of relative humidity and temperature are required.*

## Features/Benefits

- Full 0 ... 100 %RH measurement
- Accuracy up to ±2 %RH
- True two-wire transmitters with 4 ... 20 mA loop powered output (HMD60)
- Selectable signal output of 0 ... 1 V, 0 ... 5 V or 0 ... 10 V (HMD70) with optional current module also 0 ... 20 mA (HMD70)
- Vaisala HUMICAP® Sensor for excellent accuracy and long-term stability, negligible hysteresis and resistance to dust and most chemicals.
- Temperature compensated
- IP65 (NEMA 4) housing
- Also available as temperature-only transmitters HMD 60T/70T
- NIST traceable (certificate included)

The duct mounted Vaisala HUMICAP® Humidity and Temperature Transmitters HMD60 and HMD70 are designed for monitoring relative humidity and temperature in building energy management systems. The combination of high accuracy, stability and reliable operation, make these products the ideal choice for demanding applications.

## Resistant to chemicals and dust

The duct mount HMD60 and HMD70 transmitters can also be used in many industrial humidity monitoring applications, where their stability and resistance to chemicals and dust are of great value. A useful feature of these duct mount transmitters is the ability to remove the electronics without removing the unit from the duct.

## Measures both humidity and temperature

The HMD60 and HMD70 transmitters are available in three models: U for humidity measurement-only, Y for humidity and temperature measurement, and T for temperature only.

## Fast, on-site calibration

The accuracy of the transmitters is simple to check using either the Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70 or the Vaisala HUMICAP® Humidity Indicator HMI41. The calibration can be done in seconds with a single potentiometer without disturbing the operation, resulting in great savings both in maintenance time and costs.



# Technical data

### 60 series: 2-wire, 4 to 20 mA output

| | | |
|---|---|---|
| Duct mount | RH only | HMD60U |
| | RH & T | HMD60Y |
| | T only | HMD60T |

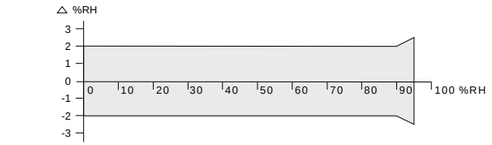
### 70 series: 3-wire, variable voltage output

| | | |
|---|---|---|
| Duct mount | RH only | HMD70U |
| | RH & T | HMD70Y |
| | T only | HMD70T |

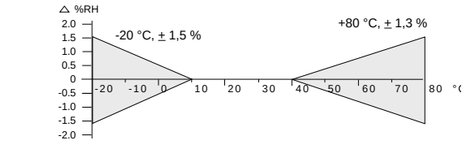
### Relative humidity

Measurement range
duct mount 0 ... 100 %RH*

Accuracy at +20 °C




Temperature dependence

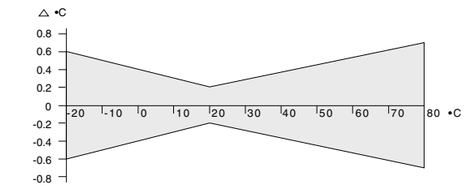



| | |
|---|---|
| Response time at +20 °C (+68 °F), 90% response | 15 s (with membrane filter) |
| Stability | ± 2 %RH / 2 years |
| Sensor | HUMICAP® 180 |

### Temperature (Y and T models)

| | |
|---|---|
| Linearity | better than 0.1 °C |
| Sensor | Pt 1000 IEC 751 class B |
| Measurement range | -20 ...+80 °C (-4 ... 176 °F) ** |

Accuracy




** Optional temperature scales are available on request.

### General - 60 series

| | |
|---|---|
| Supply voltage | 10 ... 35 VDC (RL = 0 ohm) |
| | 20 ... 35 VDC (RL = 500 ohm) |
| Output signal | 4 ... 20 mA |

### General - 70 series

Supply voltage range depends on the selected output signal

| | DC | AC |
|---|---|---|
| 0 ... 1 V | 10 ... 35 V | 9 ... 24 V |
| 0 ... 5 V | 14 ... 35 V | 12 ... 24 V |
| 0 ... 10 V | 19 ... 35 V | 16 ... 24 V |
| WITH OPTIONAL CURRENT MODULE | | |
| 0 ... 20 mA (RL = 0 ohm) | 10 ... 35 V | 11 ... 24 V |
| **0 ... 20 mA (RL = 500 ohm) | 20 ... 35 V | 17 ... 24 V |

| | |
|---|---|
| Power consumption @ 24 VAC | |
| HMD70U | 10 mA typical |
| HMD70Y | 12 mA typical |

### General

| | |
|---|---|
| Operating temperature range | |
| electronics | -5 ...+55 °C (+23 ...+131 °F) |
| probe | -20 ...+80 °C (-4 ...+176 °F) |
| Storage temperature range | -40 ...+80 °C (-40 ...+176 °F) |
| Maximum flow speed | 50 m/s |
| Current module | part no. 18945 HM |
| Housing | |
| probe | stainless steel |
| electronics | cast aluminum |
| Connections | screw terminals 0.5 ... 1.5 mm² |
| Sensor protection | |
| standard | membrane filter (part no. DRW010525) |
| optional | stainless steel sintered filter (part no. HM46670SP) |
| Cable thread-through | |
| bushing for 7 ... 10 mm (PG9) | |
| cable housing IP65 (NEMA 4) | part no. 18941HM |
| armoured cable glands (must be ordered separately) | part no. 10528HM |

Complies with EMC standard EN61326 and EN55022

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# HMW60/70 Humidity and Temperature Transmitters for wall mounting in HVAC applications

*Vaisala HUMICAP® Humidity and Temperature Transmitters HMW60 and HMW70 are designed for use in air conditioning applications where accurate and stable control of relative humidity and temperature are required.*

## Features/Benefits

- Accuracy up to ±2 %RH
- True two-wire transmitters with 4 ... 20 mA loop powered output (HMW60)
- Selectable signal output of 0 ... 1 V, 0 ... 5 V or 0 ... 10 V (HMW70)
- Vaisala HUMICAP® Sensor for excellent accuracy and long-term stability, negligible hysteresis and resistance to dust and most chemicals.
- Temperature compensated
- Also available as temperature-only transmitters HMW 60T/70T
- NIST traceable (certificate included)

The wall mounted Vaisala HUMICAP® Humidity and Temperature Transmitters HMW60 and HMW70 are designed for monitoring relative humidity and temperature in building energy management systems. The combination of high accuracy, stability and reliable operation, make these products the ideal choice for demanding applications.

### Measures both humidity and temperature

The HMW60 and HMW70 transmitters are available in three models: U for humidity measurement-only, Y for humidity and temperature measurement, and T for temperature only.

### Fast, on-site calibration

The accuracy of the transmitters is simple to check using either the Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70 or the Vaisala HUMICAP® Humidity Indicator HMI41. The calibration can be done in seconds with a single potentiometer without disturbing the operation, resulting in great savings both in maintenance time and costs.



# Technical data

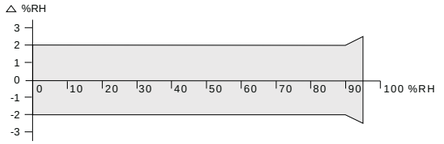
| 60 series: 2-wire, 4 to 20 mA output | | |
|---|---|---|
| Wall mount | RH only | HMW60U |
| | RH & T | HMW60Y |
| | T only | HMW60T |

| 70 series: 3-wire, variable voltage output | | |
|---|---|---|
| Wall mount | RH only | HMW70U |
| | RH & T | HMW70Y |
| | T only | HMW70T |

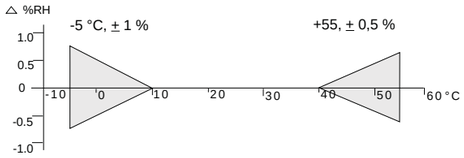
## Relative humidity

| | |
|---|---|
| Measurement range | 0 ... 95 %RH* |

Accuracy at +20 °C




Temperature dependence



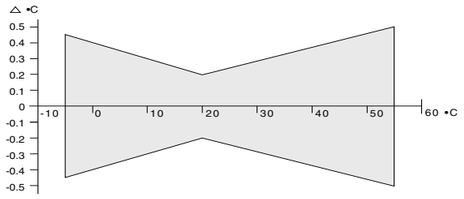

| | |
|---|---|
| Response time at +20 °C (+68 °F), 90 % response | 15 s |
| Stability | ±2 %RH / 2 years |
| Sensor | HUMICAP® 180 |

* Output signal corresponds to 0 ... 100 %RH

## Temperature (Y and T models)

| | |
|---|---|
| Linearity | better than 0.1 °C |
| Sensor | Pt 1000 IEC 751 class B |
| Measurement range | -5 ...+55 °C (+23 ... 131 °F) ** |

Accuracy'




** Optional temperature scales are available on request.

## General - 60 series

| | |
|---|---|
| Supply voltage | 10 ... 35 VDC (RL = 0 ohm)<br>20 ... 35 VDC (RL = 500 ohm) |
| Output signal | 4 ... 20 mA |

## General - 70 series

Supply voltage range depends on the selected output signal

| | DC | AC |
|---|---|---|
| 0 ... 1 V | 10 ... 35 V | 9 ... 24 V |
| 0 ... 5 V | 14 ... 35 V | 12 ... 24 V |
| 0 ... 10 V | 19 ... 35 V | 16 ... 24 V |

| | |
|---|---|
| Power consumption @ 24 VAC | |
| HMW70U | 10 mA typical |
| HMW70Y | 12 mA typical |

## General

| | |
|---|---|
| Operating temperature range | |
| electronics | -5 ...+55 °C (+23 ...+131 °F) |
| Storage temperature range | -40 ...+80 °C (-40 ...+176 °F) |
| Long-term humidity range for electronics | 0 ... 85 %RH |
| Housing | |
| material | ABS plastic |
| IP Class 30 | |
| Fire resistance | UL94-HB |
| Colour | NCS-2502-R |
| Connections | screw terminals 0.5 ... 1.5 mm² |

Complies with EMC standard EN61326 and EN55022

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# HMW40/50 and HMD40/50 Wall and Duct Mount Transmitters for HVAC Applications

*Vaisala INTERCAP® Humidity and Temperatur e Transmtters HMD/W40/50 are competitively priced and require no routine maintenance – a smart choice for your HVAC/EMC applications.*

*In energy management systems, the accurate measurement of relative humidity and temperature is essential for optimum control of the environment.*

## Features/Benefits

- Specially designed for building energy management systems
- 10 ... 90 %RH measurement
- -10 ... +60 °C (+14 ... +140 °F) operating range for duct units
- -5 ... +55 °C (+23 ... +131 °F) operating range for wall units
- 4 ... 20 mA 2-wire output (HMD/W40)
- Selectable voltage 3-wire output (HMD/W50)
- Combines excellent stability with easy installation and reliable operation
- No recalibration
- Fully interchangeable Vaisala INTERCAP® Sensor is easy to replace
- Low cost

The two and three-wire Vaisala INTERCAP® Humidity and Temperature Transmitters HMD/W40 and HMD/W50 are designed for use in energy management systems in buildings. They combine excellent stability with easy installation and reliable operation. The HMD40/50 are for duct installations and the HMW40/50 for wall installations.

### Low maintenance costs

The HMD40/50 humidity transmitters use Vaisala INTERCAP® Sensor - the world's first interchangeable capacitive humidity sensor. The transmitters require no recalibration if the sensor is changed. This means great savings in overall maintenance costs. The sensor is also insensitive to dust as well as most chemicals.

### Measures both humidity and temperature

The 40/50 series is available as humidity and temperature (Y), or humidity only (U) transmitters. The transmitters measure humidity with a ±3 %RH accuracy and a ±1 %RH stability per year.

### Selectable functions (HMD/W50)

The HMD/W50 transmitters feature selectable output signals of 0 to 1 V and 0 to 10 V. They can be powered by either AC or DC voltage.



# Technical data

### Relative humidity

| | |
|---|---|
| Measurement range (for which accuracy is specified) | 10 ... 90 %RH |
| Operating range | |
| HMD40/50 | 0 ... 100 %RH |
| HMW40/50 | 0 ... 90 %RH |
| Accuracy at +20 °C (+68 °F) | better than ±3 %RH |
| Stability | ±2 %RH over 2 years |
| Temperature dependence | <±1.5 %RH from -10 ... +60 °C (+14 ... 140 °F) |
| Sensor | INTERCAP® Sensor, part no. 15778HM |

### Temperature (40Y and 50Y)

| | |
|---|---|
| Measurement range | |
| HMD40/50 | -10 ... +60 °C (+14 ... +140 °F) |
| HMW40/50 | -5 ... +55 °C (+23 ... +131 °F) |
| Total accuracy at +25 °C | ±0.3 °C (±0.54 °F) |
| Temperature dependence | 0.01 °C/°C (0.01 °F/°F) |
| Sensor | Pt 1000 IEC 751 class B |

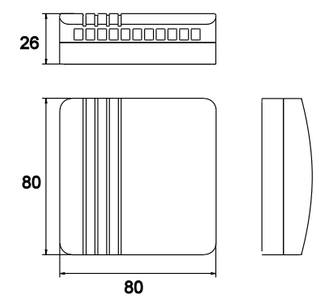
### General

| | |
|---|---|
| Output signal for relative humidity (equals 0...100 %RH) | |
| HMD/W40 | 4 ... 20 mA |
| HMD/W50 | 0 ... 1 V & 0 ... 10 V |
| Output signal for temperature | |
| HMD/W40 | 4 ... 20 mA |
| HMW50 | 0 ... 1 V & 0 ... 10 V |
| HMD50 | 0 ... 10 V |
| HMD40Y, HMD50Y | equals -40 ... +60 °C (-40 ... 140 °F) |
| HMW40Y, HMW50Y | equals -5 ... +55 °C (+23 ... 131 °F) |
| Power supply | |
| HMD/W40 | 10 ... 28 VDC |
| HMD/W50 | for 0 ... 1 V output: 12 ... 35 VDC/12 ... 24 VAC<br>for 0 ... 10 V output: 15 ... 35 VDC/15 ... 24 VAC |
| Electromagnetic compatibility: | Complies with EN61326-1, Generic Environment |
| Current consumption | |
| HMD/W50 | 6 mA typical |
| Operating temperature range | |
| HMD40/50 | -10 ... +60 °C (+14 ... +140 °F) |
| HMW40/50 | -5 ... +55 °C (+23 ... +131 °F) |
| Storage temperature range | -40 ... +60 °C (-40 ... +140 °F) |
| Operating humidity range | |
| HMD40/50 | 0 ... 100 %RH |
| HMW40/50 | 0 ... 90 %RH |
| Housing | |
| Material | ABS plastic |
| Classification (HMD40/50) | IP65(NEMA 4) |
| Colour(HMW40/50) | NCS0502-G50Y |

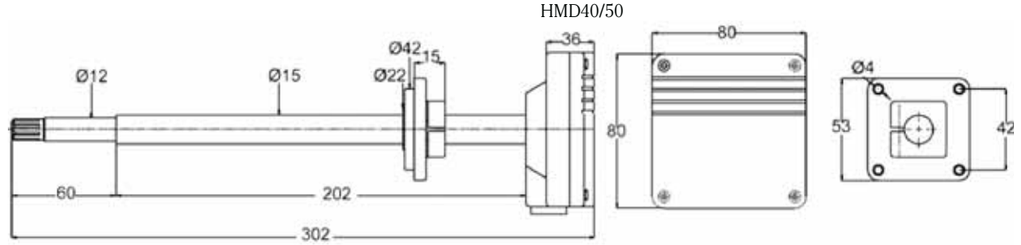
### Dimensions

Dimensions in mm.

HMW40/50




HMD40/50

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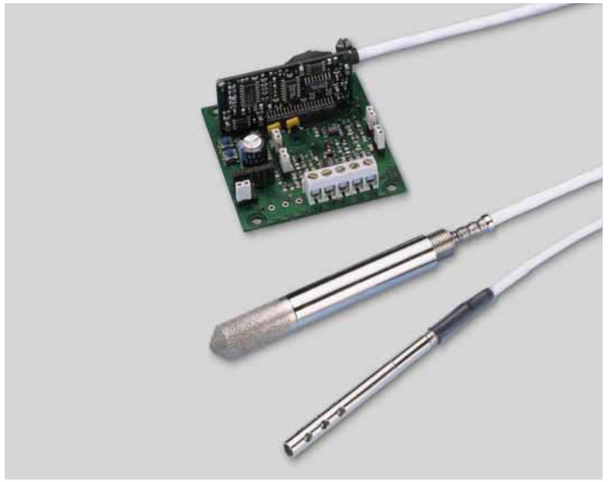
# HMM210 Series Humidity Modules for Environmental Chambers



*Vaisala HUMICAP® Humidity and Temperature Module Series HMM210 provide fast real-time measurement in a wide temperature range. The modules are especially suitable for demanding OEM applications, e.g. environmental chambers and incubators.*

## Features/Benefits

- Three probe configurations:
- Relative humidity (RH) plus temperature (T) probe.
- Dewpoint probe with probe heating. By heating the whole probe a few degrees above ambient condensation is avoided.
- Dewpoint probe described above, together with a temperature probe for obtaining relative humidity and temperature outputs.
- Three module configurations
- Different probe and cable lengths
- Chemical purge option maintains high measurement performance in demanding chemicalconditions.
- Calibration certificate included

The Vaisala HUMICAP® Humidity and Temperature Module Series HMM210 are designed for OEM type applications needing humidity or dewpoint measurement in demanding environments, e.g. in environmental chambers growth chambers and incubators.

## Demanding applications

The HMM210 modules are optimized for harsh environments with both high humidities and a wide temperature range. The humidity measurement is fully temperature compensated. In addition, the modules remain accurate and reliable under extreme conditions where a combination of high humidity and rapidly changing temperature can result in condensation on the sensor head.

The modules are highly versatile and flexible. They provide either relative humidity and temperature or dewpoint measurement with various configurations. All modules have microprocessor based electronics and are equipped with analog or digital outputs.

## Unique warmed probe

The warmed probe and composite sensor, available on the dewpoint probe configuration, is warmed to always remain a few degrees higher than ambient. Advantages of this patented technique include:

- No condensation problems on the probe, as the temperature of the probe always remains higher than the ambient.
- Fast response time, especially in rapidly changing temperatures.
- Improved stability and accuracy in high humidities.

## Vaisala HUMICAP® Sensor and chemical purge option

The HMM210 modules use Vaisala HUMICAP®180R sensors for best possible stability. The sensor is insensitive to dust and to most chemicals. In conditions of extraordinary high levels of chemicals and cleaning agents, chemical purge is available as an option. With chemical purge, contaminants are evaporated from the sensor and performance is returned to normal.



# Technical data

### Relative Humidity

| | |
|---|---|
| Measurement range | 0 ... 100 %RH |
| Accuracy (including non-linearity, hysteresis and repeatability) | ±2 %RH (0 ... 90 %RH)<br>±3 %RH (90 ... 100 %RH) |
| Response time (90 % at +20 °C/+68 °F) in still air (with sintered filter) | 60 s |
| Typical temperature dependence of electronics | 0.02 %RH/°C (0.02 %RH/°F) |
| Humidity sensor | HUMICAP®180R |

### Temperature

| | |
|---|---|
| Measurement range | -70 ...+180 °C (-94 ...+356 °F) |
| Typical accuracy of electronics at +20 °C | ±0.1 °C (±0.18 °F) |
| Typical temperature dependence of electronics | 0.0025°C/°C (0.0025 °F/°F) |
| Temperature sensor in RH+T probe: | |
| HMM211 and HMM213 | Pt 100 RTD IEC 751 1/3 Class B |
| HMM212 | Pt 1000 RTD IEC 751 1/3 Class B |
| Additional temperature probe | Pt 100 RTD IEC 751 1/4 Class B |

### Outputs

| | |
|---|---|
| Two analog outputs selectable | |
| HMM211 | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V<br>0 ... 20 mA |
| HMM212 | 4 ... 20mA (loop powered) |
| Digital output | |
| HMM213 | RS232 |

### General

| | |
|---|---|
| Operating temperature range | |
| Probe | -70 ...+180 °C (-94 ...+356 °F) |
| Electronics | -5 ...+55 °C (+23 ...+131 °F) |
| Storage temperature range (Electronics) | -40 ...+70 °C (-40 ...+158 °F) |
| Sensor protection (standard) | stainless steel sintered filter |
| Connections | screw terminals for 0.5 ... 1.5 mm² wires |

### Power Supply

| | |
|---|---|
| Operating voltage | 10 ... 35 VDC |
| In modules with analog outputs the supply range depends to a certain extent on the selected output range. | |
| Current consumption without sensor head warming or re-gaining option | |
| HMM211 & HMM213 | 12 mA at 35 VDC |

### Configuration Options

| | Compatible with modules: | | |
|---|---|---|---|
| PROBES | HMM211 | HMM212 | HMM213 |
| RH+T | yes | yes | yes |
| Dewpoint (heated composite sensor) | yes | | yes |
| Temperature | yes | | yes |
| CABLE LENGTHS | | | |
| RH+T and Dewpoint probes | 65, 150 and 300 cm | | |
| Temperature probe | 150 and 300 cm | | |
| CHEMICAL PURGE | Automatically takes place at power-up | | |

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# HMM100 Humidity Module for Environmental Chambers

*The Vaisala HUMICAP® Humidity Module HMM100.*

## Features/Benefits

- Full temperature compensation over the operating temperature range of -70 °C ... +180 °C
- High temperature tolerance, also suitable for heat-sterilization
- Excellent measurement accuracy with Vaisala HUMICAP® 180R sensor
- Durable
- Easy field calibration by trimmers
- Maintenance-free
- Easy to install
- Applications: test chambers, incubators

## The HMM100

The Vaisala HUMICAP® Humidity Module HMM100 is an open frame module for integration into environmental chambers. The modules provide a single analog output channel for relative humidity (RH) or dewpoint ($T_d$).

Two probes are available, one made of plastics, the other of stainless steel. Several cable lengths up to 3 meters are available. Both the probes have the Vaisala HUMICAP® 180R sensor which ensures excellent measurement accuracy.

## Robust and reliable

The HMM100 probe works in freezing conditions (-70 °C) and also in temperatures up to +180 °C. The HMM100 is easy to install and the probe can be freely placed in a test chamber as the speed of airflow does not affect the measurement.

## Maintenance-free

Compared to psychrometers, the HMM100 is practically maintenance-free. There is no wick that needs changing and there is no need for a water tank or water pump. Thus, environmental stress screening can be done reliably.

## Accessories

The accessories available are a component board mounting bracket with a lid, probe clamp, USB-cable for service use, a module housing and a probe mounting flange.



# Technical data

## Performance

| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Accuracy (incl. non-linearity, hysteresis and repeatability) | |
| temperature range | -20 ... +40 °C |
| 0 ... 90 %RH | ±2 %RH |
| 90 ... 100 %RH | ±3 %RH |
| temperature range | -40 ... -20 °C, +40 ... +180 °C |
| 0 ... 90 %RH | ±2.5 %RH |
| 90 ... 100 %RH | ±3.5 %RH |
| Factory calibration uncertainty (+20 °C) | ±1.5 %RH |
| Humidity sensor | Vaisala HUMICAP® 180R |
| DEW POINT TEMPERATURE | |
| Measurement range | -20 ... +100 °C (-4 ... +212 °F)$T_d$ |
| Accuracy (incl. non-linearity, hysteresis and repeatability when dew point depression <20 °C (Ambient temperature - dew point) | ±2 °C $T_d$ |

## Operating environment

| | |
|---|---|
| Operating temperature range | |
| component board | -5 ... +55 °C (+23 ... +131 °F) |
| stainless steel and plastic probe | -70 ... +180 °C (-94 ... +356 °F) |
| porous PTFE filter stainless steel, sintered filter | -70 ... +180 °C (-94 ... +356 °F) |
| plastic grid, membrane filter | -20 ... +80 °C (-4 ... +176 °F) |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, for use in light industrial environments |

## Input and outputs

| | |
|---|---|
| Operating voltage | |
| 2-wire model | 24 VDC |
| 3-wire model | 10 ... 35 VDC or 24 VAC<br>15 ... 35 VDC or 24 VAC when 0 ... 10 V output is used |
| Power consumption | 6 mA |
| Analog output types (1 output selectable) | |
| 2-wire model | 4 ... 20 mA (loop-powered) |
| 3-wire model | 0 ... 20 mA, 0 ... 1 V/5 V/10 V |
| Max. wire size | 0.5 ... 1.5 mm² (AWG) |
| Service port | M8 connector for USB cable |

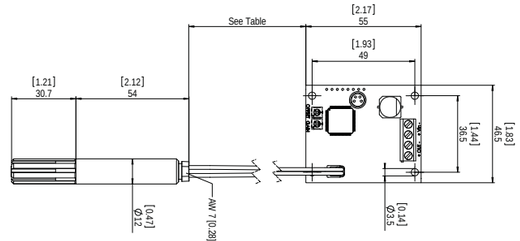
## Mechanics

| | |
|---|---|
| Service cable connector | M8 series 4-pin (male) |
| Probe diameter | 12 mm |
| Probe cable lengths | 0.6/1.55/2.9 m |
| Probe material | |
| plastics | PPS |
| stainless steel | AISI316/PPS |
| Probe mounting clamp | AISI316 |
| Mounting bracket material | |
| lid | ABS/PC |
| bottom plate | Al |
| Module housing material | ABS/PC (cover) |

## Options and accessories

| | |
|---|---|
| Humidity sensor | HUMICAP180R |
| Membrane filter | 10159HM |
| Plastic grid filter | 6221 |
| Porous PTFE filter | 219452SP |
| Stainless steel sintered filter | HM47280SP |
| Mounting bracket with lid | 225979 |
| Module housing (IP65) | 226060 |
| Probe mounting flange | 226061 |
| Probe mounting clamp set (10 pcs) | 226067 |
| USB cable | 226068 |

## Dimensions

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# Vaisala INTERCAP® Humidity and Temperature Probe HMP60

*The HMP60 for extreme conditions.*

## Features/Benefits

- Miniature-size humidity probe
- Low power consumption
- Measurement range: 0 ... 100 %RH; -40 ... +60°C
- Cable detachable with standard M8 connector
- Rugged metal housing
- Interchangeable Vaisala INTERCAP® Sensor
- Optional RS485 digital output

  Optional dew point output
- Applications: volume applications, integration into other manufacturers' equipment, glove boxes, greenhouses, fermentation chambers, data loggers

### HMP60

The HMP60 is a simple, durable and cost-effective humidity probe. It is suitable for volume applications, integration into other manufacturers' equipment, incubators, glove boxes, greenhouses, fermentation chambers, and data loggers.

### Easy installation

The probe cable has a screw-on quick connector for easy installation. Different cable lengths are available. Also other compatible M8 series cables can be used. Accessories are available for different installation needs.

### Low current consumption

The HMP60 is suitable for battery-powered applications because of its very low current consumption.

### Several outputs

There are two configurable voltage outputs with relative humidity, temperature or dew point scaling. Four voltage output ranges are available.

### Rugged design

The HMP60 is designed for extreme conditions. The aluminum body of the HMP60 is classified as IP65. The probe has a sealed structure and the sensor is protected by a membrane filter and a plastic grid, or optionally by a stainless steel filter.

### Recalibration not needed

The Vaisala INTERCAP® Sensor is interchangeable. No recalibration is required; the sensor can simply be replaced, also in the field.



# Technical data

## Performance

| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Typical accuracy | |
| temperature range | 0 ... +40 °C |
| 0 ... 90 %RH | ±3 %RH |
| 90 ... 100 %RH | ±5 %RH |
| temperature range | -40 ... 0 °C, +40 ... +60 °C |
| 0 ... 90 %RH | ±5 %RH |
| 90 ... 100 %RH | ±7 %RH |
| Humidity sensor | Vaisala INTERCAP® |
| TEMPERATURE | |
| Measurement range | -40 ... +60 °C |
| Accuracy over temperature range -40 ... +60 °C | ±0.6 °C |
| DEW POINT | |
| Measurement range | -40 ... +60 °C |
| Typical accuracy | |
| temperature range | 0 ... +40 °C |
| when dew point depression < 15 °C | ±2 °C |
| temperature range | -40 ... 0 °C, +40 ... +60 °C |
| when dew point depression < 10 °C | ±3 °C |

dew point depression = ambient temperature - dew point

## Operating environment

| | |
|---|---|
| Operating temperature | -40 ... +60 °C |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Basic immunity test requirements |

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 5 ... 28 VDC / 8 ... 28 VDC with 5 V output |
| (Use lowest available operating voltage to minimize heating.) | 8 ... 28VDC with loop power converter |
| Current consumption | 1 mA average, max. peak 5 mA |
| Start-up time at operating voltage | <14 V: 1 s; >14 V: 4 s |
| Outputs | |
| 2 channels | 0 ... 1 VDC/0 ... 2.5 VDC / 0 ... 5 VDC/1 ... 5 VDC |
| 1-channel loop-power converter (separate module, compatible with humidity accuracy only) | 4 ... 20 mA |
| digital output (optional) | RS485 2-wire half duplex |
| External loads | |
| 0 ... 1 V | $R_L$ min 10 kΩ |
| 0 ... 2.5 V /0 ... 5 V | $R_L$ min 50 kΩ |

## Mechanics

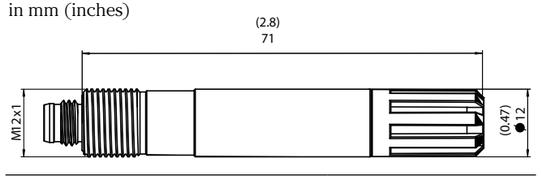
| | |
|---|---|
| Materials | |
| body | chrome coated aluminum |
| grid filter | chrome coated ABS plastic |
| cable | polyurethane or FEP |
| Housing classification | IP65 |
| Body thread | MI2x1 / 10 mm |
| Cable connector | 4-pin M8 (IEC 60947-5-2) |
| Weight with 0.3 m cable | 23 g |

## Options and accessories

| | |
|---|---|
| Vaisala INTERCAP® Sensor, 1 piece | 15778HM |
| Vaisala INTERCAP® Sensor, 10 pcs | INTERCAPSET-10PCS |
| Sensor protection | |
| plastic grid | DRW010522 |
| membrane filter | DRW010525 |
| stainless steel sintered filter | HM46670SP |
| 4 ... 20mA loop power converter | UI-CONVERTER-1 |
| Mounting bracket with lid | 225979 |
| Plastic M12 installation nuts, pair | 18350SP |
| USB cable for PC connection | 219690 |
| Probe mounting clamp set, 10 pcs | 226067 |
| Probe mounting flange | 226061 |
| Connection cables | |
| 0.3 m PU | HMP50Z032 |
| 3 m PU | HMP50Z30A |
| 180°C 3 m FEP | 226902 |

## Dimensions

in mm (inches)

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# Vaisala HUMICAP® Humidity and Temperature Probe HMP110

*The HMP110 with excellent stability and high chemical tolerance.*

## Features/Benefits

- Miniature-size humidity transmitter
- Low power consumption and fast startup for battery powered applications
- Measurement range: 0 ... 100 %RH; -40 ... +80°C
- Cable detachable with standard M8 quick connector
- Reliable: Latest generation HUMICAP® 180R sensor for best stability and high chemical tolerance. IP65 metal housing.
- Optional RS485 digital output
- Traceable: Comes with calibration certificate. ±1.7%RH measurement accuracy (0 ... 90%RH)
- HMP110R replacement probe service available for easy maintenance
- Optional dew point calculation

## HMP110

The HMP110 is a trouble-free and cost-effective humidity transmitter with high accuracy and good stability. It is suitable for volume applications or integration into other manufacturers' equipment. The HMP110 is also suitable for glove boxes, greenhouses, fermentation and stability chambers, data loggers, and incubators.

## Easy installation

The probe cable has a screw-on quick connector for easy installation. Different cable lengths and accessories are available.

## Low current consumption

HMP110 is suitable for battery-powered applications because of its very low current consumption. It also has a fast start-up time.

## Several outputs

The temperature measurement is a standard feature, dew point measurement is optional. Three standard voltage outputs are available.

## Robust design

The aluminum body of the HMP110 is classified as IP65. Thus, it survives rough conditions. The HMP110 has high chemical tolerance because of the HUMICAP® 180R sensor.

## Easy maintenance

Maintaining measurement traceability is easy using the HMP110R replacement probe. We send you a replacement probe, you detach the old probe and send it back to us. In this way the measurement is available at all times without interruptions.



# Technical data

## Performance

| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Accuracy (incl. non-linearity, hysteresis and repeatability) | |
| temperature range | 0 ... +40 °C |
| 0 ... 90 %RH | ±1.7 %RH |
| 90 ... 100 %RH | ±2.5 %RH |
| temperature range | -40 ... 0 °C, +40 ... +80 °C |
| 0 ... 90 %RH | ±3.0%RH |
| 90 ... 100 %RH | ±4.0%RH |
| Factory calibration uncertainty (+20 °C) | ± 1.5%RH |
| Humidity sensor | Vaisala HUMICAP® 180R |
| Stability | ±2 %RH over 2 years |
| TEMPERATURE | |
| Measurement range | -40 ... +80 °C |
| Accuracy over temperature range | |
| 0 ... +40 °C, | ±0.2 °C |
| -40 ... 0 °C, +40 ... +80 °C | ±0.4 °C |
| Temperature sensor | Pt1000 RTD 1/3, Class B IEC 751 |
| DEW POINT | |
| Measurement range | -40 ... +80 °C |
| Accuracy (incl. non-linearity, hysteresis and repeatability) | |
| temperature range | 0 ... +40 °C |
| when dew point depression < 15 °C | ±1 °C |
| when dew point depression 15 ... 25°C | ±2 °C |
| temperature range | -40 ... 0 °C, +40 ... +80 °C |
| when dew point depression < 15 °C - dew point depression = ambient temperature - dew point | ±2 °C |

## Operating environment

| | |
|---|---|
| Measurement range | -40 ... +80 °C |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Basic immunity test requirements |

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 5 ... 28 VDC / 8 ... 28 VDC with |
| (Use lowest available operating voltage to minimize heating) | 5 V output |
| | 8 ... 28VDC with loop power converter |
| Current consumption | 1 mA average, max. peak 5 mA |
| Start-up time at operating voltage | <14 V: 1 s |
| | >14 V: 4 s |
| Outputs | |
| 2 channels | 0 ... 1 VDC/0 ... 2.5 VDC / 0 ... 5 VDC/1 ... 5 VDC |
| 1-channel loop-power converter (separate module, compatible with humidity accuracy only) | 4 ... 20 mA |
| digital output (optional) | RS485 2-wire half duplex |
| External loads | |
| 0 ... 1 V | $R_L$ min 10 kΩ |
| 0 ... 2.5 V /0 ... 5 V | $R_L$ min 50 kΩ |

## Mechanics

| | |
|---|---|
| Materials | |
| body | chrome coated aluminum |
| grid filter | chrome coated ABS plastic |
| cable | polyurethane or FEP |
| Housing classification | IP65 |
| Body thread | MI2x1 / 10 mm |
| Cable connector | 4-pin M8 (IEC 60947-5-2) |
| Weight with 0.3 m cable | 23 g |

## Options and accessories

| | |
|---|---|
| Sensor protection | |
| plastic grid | DRW010522 |
| membrane filter | DRW010525 |
| stainless steel sintered filter | HM46670SP |
| 4 ... 20mA loop power converter | UI-CONVERTER-1 |
| Mounting bracket with lid | 225979 |
| Plastic M12 installation nuts, pair | 18350SP |
| USB cable for PC connection | 219690 |
| Probe mounting clamp set, 10 pcs | 226067 |
| Probe mounting flange | 226061 |
| Connection cables | |
| standard 0.3 m | HMP50Z032 |
| standard 3 m | HMP50Z30A |
| 80 °C 1.5 m | 225777SP |
| 80 °C 3 m | 225229SP |
| 180 °C 3 m FEP | 226902 |

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# HM70 Hand-Held Humidity and Temperature Meter for Spot-Checking Applications

*The Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70 is a high-performance, portable humidity reference that is exciting to use.*

## Features/Benefits

- Multilingual user interface
- Shows measurement trends graphically
- Proven Vaisala HUMICAP® Sensor technology
- 3 probe alternatives, temperature measurement ranges between -70 and +180 °C
- Multiprobe operation; dewpoint and $CO_2$ probes can also be connected
- 2 probes can be connected simultaneously
- Displays various humidity parameters
- Sensor preheat and chemical purge options for demanding conditions
- NIST traceable (certificate included)

The Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM70 is designed for demanding humidity measurements in spot-checking applications. It is also ideal for field checking and calibration of Vaisala's fixed humidity instruments.

The HM70 incorporates the latest generation of the Vaisala HUMICAP® Sensor. It is reliable and has better than ever long-term stability. Additionally, it has a sensor that copes well with chemical interference and provides accuracy that lasts in demanding conditions.

The chemical purge option maintains measurement accuracy in environments with high concentrations of chemicals. The sensor preheat option reduces measurement delays as it keeps the sensor dry when the probe is inserted into hot and humid processes.

## Three probes to choose from

The HMP75 is a general purpose probe whereas the HMP76 is a long, stainless steel probe especially suitable for spot-checking in ducts. The HMP77 is a small probe at the end of a 5-meter cable. The probe is ideal for difficult-to-reach areas and for on-site calibration of Vaisala's process transmitters.

In addition, the HM70 supports the use of Vaisala's dewpoint, carbon dioxide and moisture in oil probes, allowing measurements in several multiparameter applications.

## MI70 Link

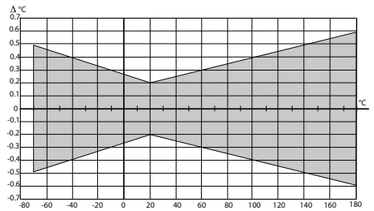
The optional MI70 Link Windows® software and the USB connection cable form a practical tool for transferring logged data and real time measurement data from the HM70 to a PC.



# Technical data

### HMP75, HMP76 and HMP77 probes
### Measured variables

| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Accuracy (including nonlinearity, hysteresis and repeatability) | |
| at +15 ... +25 °C (+59 ... +77 °F) | ±1 %RH (0 ... 90 %RH) |
| | ±1.7 %RH (90 ... 100 %RH) |
| at -20 ... +40 °C (-4 ... +104 °F) | ±(1.0 + 0.008 x reading) %RH |
| at -40 ... +180 °C (-40 ... +356 °F) | ±(1.5 + 0.015 x reading) %RH |
| Factory calibration uncertainty (+20 °C / +68 °F) | ±0.6 %RH (0 ... 40 %RH) |
| | ±1.0 %RH (40 ... 97 %RH) |
| | (Defined as ±2 standard deviation limits.) |
| Response time (90%) at +20 °C (+68 °F) in still air | |
| HMP75 (with standard plastic grid) | 17 s |
| HMP76 (with standard sintered bronze filter) | 60 s |
| HMP77 (with standard plastic grid and stainless steel netting) | 50 s |
| Sensor | HUMICAP® 180R |
| | HUMICAP® 180RC (chemical purge, sensor preheat) |
| Typical long-term stability | better than 1 %RH / year |
| TEMPERATURE | |
| Measurement range | |
| HMP75 | -20 ... +60 °C (-4 ... +140 °F) |
| HMP76 | -50 ... +120 °C (-58 ... +248 F) |
| short time | -50 ... +180 °C (-58 ... +356 °F) |
| HMP77 | -70 ... +180 °C (-94 ... +356 °F) |
| Accuracy at +20 °C (+68 °F) | ±0.2 °C (±0.36 °F) |
| Accuracy over temperature range | (see graph) |




| | |
|---|---|
| Temperature sensor | Pt100 IEC751 1/3 class B |

### Probe general

| | |
|---|---|
| Operating temperature range for electronics | -40 ... +60 °C |
| | (-40 ... +140 °F) |
| Housing classification | IP65 (NEMA 4) |
| Housing material | ABS/PC blend |
| Probe material | Stainless steel (AISI316L) |
| Cable length between probe and indicator | 1.9 m |

### MI70 measurement indicator
### Indicator general

| | |
|---|---|
| Menu languages | English, Chinese, French, Spanish, German, Russian, Japanese, Swedish, Finnish |
| Display | LCD with backlight, graphic trend display of any parameter, character height up to 16 mm |
| Max. no. of probes | 2 |
| Power supply | Rechargeable NiMH battery pack with AC-adapter or 4xAA-size alkalines, type IEC LR6 0 |
| Analog output | 0... 1 VDC |
| Output resolution | 0.6 mV |
| PC interface | MI70 Link software with USB or serial port cable |
| Data logging capacity | 2700 points |
| Alarm | audible alarm function |
| Operating temperature range | -10 ... +40 °C (+14 ... +104 °F) |
| Operating humidity range | non-condensing |
| Housing classification | IP54 |
| Battery operation time | |
| Continuous use | 48 h typical at +20 °C (+68 F) |
| Data logging use | up to a month, depending on logging interval |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Portable Equipment |

### MI70 indicator + probe = HM70

| | |
|---|---|
| ACCESSORIES | |
| Carrying cases | |
| for MI70 and HMP75/77 probe | MI70CASE |
| for MI70 and HMP75/76 probe | MI70CASE2 |
| Transmitter connection cables for | |
| HMT330 & HMT100 Series | 211339 |
| HM60/70/140 Series | HMA6070 |
| MI70 Link software with USB cable | 219687 |
| MI70 Link software with serial port cable | MI70LINK |
| Analog output cable | 27168ZZ |
| Sensor protection HMP75 | |
| Plastic PC grid (HMP75 standard) | 6221 |
| Membrane filter | 10159HM |
| Sintered bronze filter | DRW212987SP |
| HMP76/77 | |
| Plastic PPS grid | DRW010276SP |
| Sintered stainless steel filter | HM47280SP |
| Sintered bronze filter (HMP76 standard) | DRW212987SP |
| PPS grid with SS netting (HMP77 standard) | DRW010281SP |

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# HMI41 Indicator and HMP46 High Temperature Probe

*The Vaisala HUMICAP® Humidity Indicator HMI41 equipped with the Vaisala HUMICAP® Humidity and Temperature Probe HMP46 is an ideal combination for spot checking and field calibration.*

The Vaisala HUMICAP® Humidity Indicator HMI41 fitted with the Vaisala HUMICAP® Humidity and Temperature Probe HMP46 can be used for spot checking humidity and temperature in ducts or chambers. Typical applications are plant maintenance, installation and inspection of air conditioning systems, production and storage areas and production processes. In addition, it is suitable for field checking Vaisala's humidity transmitters.

## Withstands high temperatures

The HMP46 operates in full humidity range of 0 ... 100 %RH. The temperature range is from -40 to +100 °C (-40 ... +212 °F). For short periods of time, the probe can withstand temperatures up to +180 °C (+356 °F).

The HMP46 probe is solid and rugged. Its stainless steel probe is made to withstand rough handling in mechanically demanding applications. The probe's long shaft can also reach otherwise unreachable places.

## Versatile and easy to use

In addition to displaying the humidity and temperature readings, the HMI41 indicator calculates dewpoint and wet bulb temperature, absolute humidity and mixing ratio.

The indicator has an easy-to-read two line liquid crystal display. The display units (metric or non-metric) are easily selected.

### Features/Benefits

- RH measurement range 0 ... 100 %RH
- Temperature measurement range -40 ... +100 °C (-40 ... +212 °F), for short periods up to +180 °C (+356 °F)
- Calculates dewpoint, wet bulb temperature, absolute humidity and mixing ratio
- Versatile and easy-to-use
- Incorporates Vaisala HUMICAP® Sensor
- Excellent stability
- Data collection with serial line
- NIST traceable (certificate included)
- Optional carrying case and calibration cable
- Available as a complete calibration kit HMK41

These features, plus fast response time, high measurement accuracy and excellent stability, as well as the wide temperature range of the probe, make the HMI41/HMP46 combination an ideal choice for the most demanding applications.

## High performance sensor

The HMP46 probe incorporates Vaisala HUMICAP® Sensor. This sensor has high accuracy, excellent long-term stability and negligible hysteresis. In addition, the sensor is insensitive to dust, particulate dirt and most chemicals.



# Technical data

### HMI41 indicator

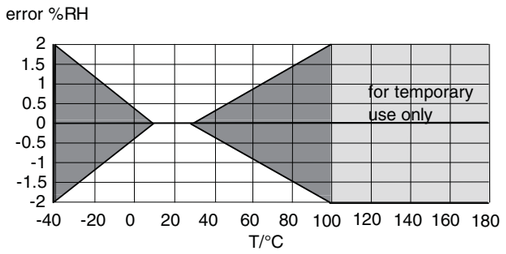
| | |
|---|---|
| Calculated variables | dewpoint temperature, absolute humidity, wet bulb temperature, mixing ratio |
| Resolution | 0.1 %RH; 0.1 °C/°F |
| Power supply | 4 batteries, type AA (LR 6) |
| Battery operation time (alkaline batteries) | 72 h continuous use |
| Auto-off function | |
| Operating temperature | -20 ... +60 °C (-4 ... +140 °F) |
| Storage temperature | -40 ... +70 °C (-40 ... +158 °F) |
| Display | two line LCD |
| Housing material | ABS plastic |
| Housing classification | IP53 (with connectors blocked) |
| Weight (incl. batteries) | 300 g |
| Maximum measurement error of indicator at +20 °C | |
| humidity | ±0.1 %RH |
| temperature | ±0.1 °C (±0.18 °F) |

### HMP46 probe

HUMIDITY

| | |
|---|---|
| Measurement range | 0 ... 100 %RH, non-condensing |
| Accuracy (incl. nonlinearity, hysteresis and repeatability) at +20 °C | |
| Maximum achievable accuracy when calibrated against high quality, certified humidity standards: | |
| 0 ... 90 %RH | ±1 %RH |
| 90 ... 100 %RH | ±2 %RH |
| When calibrated against salt solutions (ASTM E104-85) | |
| 0 ... 90 %RH | ±2 %RH |
| 90 ... 100 %RH | ±3 %RH |

Temperature Dependence

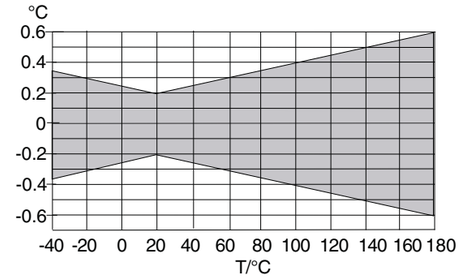



| | |
|---|---|
| Typical long-term stability | better than 1 %RH per year |
| Response time (90%) at +20 °C in still air w/sintered filter | 15 s |
| Humidity sensor | HUMICAP® 180 |

TEMPERATURE

| | |
|---|---|
| Continuous measurement | -40 ... +100 °C (-40 ... +212 °F) |
| Short-term measurement | -40 ... +180 °C (-40 ... +356 °F) |
| Accuracy at +20 °C (+68 °F) | ±0.2 °C (±0.36 °F) |

Accuracy over the measurement range




| | |
|---|---|
| Temperature sensor | Pt 100 IEC 751 1/3 class B |

### General

| | |
|---|---|
| Typical ranges of calculated variables | |
| dewpoint temperature | -20 ... +100 °C (-4 ... +100 °F) |
| absolute humidity | 0 ... 600 g/m³ |
| wet bulb temperature | 0 ... 100 °C (32 ... 212 °F) |
| mixing ratio | 0 ... 600 g/kg d.a. |

The accuracies of these calculated variables are limited by the accuracies of the measured variables on which they are based, namely RH and T. The RH and T accuracies are stated under HMP46 probe.

| | |
|---|---|
| Cable length | 1500 mm; extended spiral cable |
| Operating temperature range for electronics | -20 ... +60 °C (-4 ... +140 °F) |
| Housing material | |
| Electronics housing | ABS plastic |
| Probe | stainless steel |
| Housing classification electronics | IP65 (NEMA 4) |
| Sensor protection | sintered filter, part no. 0195 |
| | optionmembrane filter, part no. 10159HM (max +80 °C / +176 °F) |
| | plastic grid, part no. 6221 (max +80 °C / +176 °F) |
| Weight | 450 g |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Portable Equipment |

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# HMP41, HMP42 and HMP45 Probes for HMI41 Indicator

*The HMI41 indicator with the HMP41 probe.*

*HMI41 with the HMP42 probe.*

*HMI41 with the HMP45 probe.*

Vaisala HUMICAP® Humidity Indicator HMI41 can be used with any one of the four probes to quickly and easily measure humidity and temperature, and to make other measurement calculations such as dewpoint, wet bulb temperature, absolute humidity and mixing ratio.

The HMI41 has an easy-to-read LCD display. Temperature readout is available in either degrees Centigrade or Fahrenheit. Calculated variables are available in metric and non-metric format.

## Ideal for spot checking applications

The HMI41 indicator with probes is ideal for use in a variety of spot checking applications such as plant maintenance, air-conditioning system installation and inspection, freezers and storage and production areas.

## Vaisala HUMICAP® Humidity and Temperature Probe HMP41:

This probe is fix-mounted directly on the HMI41 indicator. It can be upgraded to an HMP45 by purchasing the HMH45 handle and cable option.

## Vaisala HUMICAP® Humidity and Temperature Probe HMP42:

The HMP42 probe can be used for spot checking humidity and temperature in applications which require an extremely thin probe, such as:

- for monitoring the drying of structures during construction or after water damage
- in tight places
- in ducts or chambers
- under a linoleum floor

The probe diameter is only 4 mm, allowing access into very small, tight, and hard-to-reach spaces.

## Vaisala HUMICAP® Humidity and Temperature Probe HMP45:

This probe for general purposes features an extended spiral cable.

## Vaisala HUMICAP® Humidity and Temperature Probe HMP46:

See preceding data sheet.

### Features/Benefits

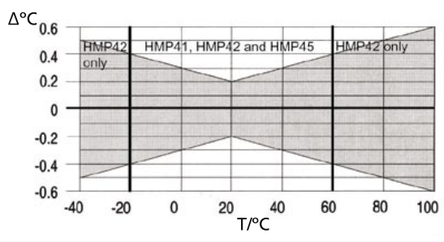
- Humidity measurement range 0 ... 100 %RH
- Temperature measurement range HMP41, HMP45: -20 ... +60 °C (-4 ... +140 °F) HMP42: -40 ... +100 °C (-40 ... +212 °F)
- For spot checking measurements
- Versatile and easy-to-use
- The HMI41 Indicator can be used with any of the four available probes
- Extremely thin 4 mm probe head (HMP42)
- Incorporates Vaisala HUMICAP® Sensor, which provides high accuracy, excellent long-term stability, neglible hysteresis, and insensitivity to dust and most chemicals
- NIST traceable (certificate included)



# Technical data

### HMP41, HMP42, and HMP45 probes

| | |
|---|---|
| HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Accuracy at +20 °C (+68 °F) | |
| when calibrated against salt solutions (ASTM E014-85) | ±2 %RH (0 ... 90 %RH)<br>±3 %RH (90 ... 100 %RH) |
| Temperature dependence of electronics | ±0.05 %RH/°C |
| Typical long-term stability | better than 1 %RH per year |
| Response time (90%) at +20 °C in still air | (HMP41, HMP45) 15 s<br>(HMP42) 30 s |
| Sensor HMP41 & 45 | HUMICAP® 180 |
| Sensor HMP42 | HUMICAP® MINI |
| TEMPERATURE | |
| Measurement range probe | |
| HMP41, HMP45 | -20 ... +60 °C (-4 ... +140 °F) |
| HMP42 | -40 ... +100 °C (-40 ... +212 °F) |
| Temperature accuracy over measurement range | |
| Sensor (HMP41 & 45) | PT 1000 IEC 751 1/3 class B |
| (HMP 42) | PT 100 IEC 751 class B |




### General

| | |
|---|---|
| Typical ranges of calculated variables | |
| dewpoint temperature | -20 ... +60 °C (-4 ... +140 °F) |
| absolute humidity | 0 ... 160 g/m³ |
| wet bulb temperature | 0 ... +60 °C (32 ... +140 °F) |
| mixing ratio | 0 ... 160 g/Kg d.a. |

The accuracies of these calculated variables are limited by the accuracies of the measured variables on which they are based, namely RH and T. The RH and T accuracies are stated above in the probe section.

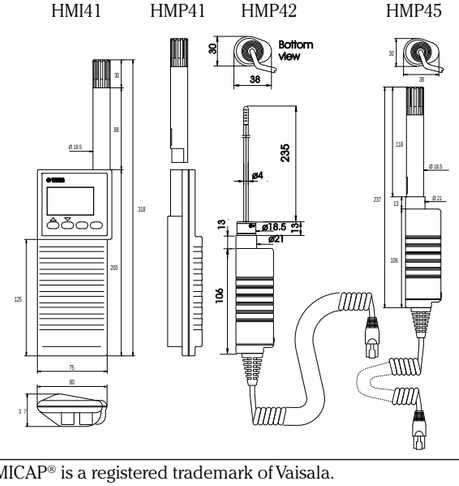
| | |
|---|---|
| Cable length (HMP42 & 45) | 1500 mm; extended spiral cable |
| Operating temperature range | |
| HMP41 | -20 ... +60 °C (-4 ... +140°F) |
| HMP42 | -40 ... +100 °C (-40 ... +212 °F) |
| HMP45 | -40 ... +60 °C (-40 ... +140 °F) |
| Battery operation time (alkaline batteries) | 72 h continuous use |
| Housing material | ABS plastic |
| Housing classification, electronics | IP65 (NEMA 4) |
| Sensor protection | |
| HMP41 & 45 plastic grid | HM46717 |
| option membrane filter | 2787HM |
| HMP42 steel grid | 19867HM |
| membrane tube set (5pcs) | 19858HM |
| Weight | |
| HMP41 | 30 g |
| HMP42 | 200 g |
| HMP45 | 160 g |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Portable Equipment. |

### Accessories

| | |
|---|---|
| Serial interface cable | 19446ZZ |
| Carrying case for HMI41 and HMP41/45 | HM36736 |
| Aluminum case for HMP41/42/45/46 | MI70CASE2 |
| Rigid plastic case for HMP41/42/45/46 | 210614 |
| HMP42 | |
| Calibration adapter | HM37067 |
| Rubber sleeve set | 19809HM |

### Dimensions

Dimensions in mm.

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# HM34 Pocket Size Relative Humidity Meter

The Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM34 provides a fast and convenient way to accurately spot-check relative humidity and temperature.

## Fast and easy-to-use

In measurement mode, the extendable probe just slides out. Normally, measurement takes only a few seconds. The HM34 meter includes a HOLD button which allows the user to retain an RH or T measurement until it has been noted or recorded.

If no buttons are pressed for three minutes, the unit automatically switches itself off. This automatic POWER-OFF function prevents the possibility of accidental discharge of the HM34's battery.

After the measurement is completed, the probe is slid back into the meter casing. Between spot checks, the meter is normally stored in its carrying case.

*The Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter HM34 provides accurate spot checks of humidity and temperature.*

## Features/Benefits

- Ideal for spot checking humidity levels
- Measurement range 0 ... 100 %RH
- Fast response with ±2% accuracy
- Temperature measurement range -20 ... +60 °C (-4 ... +140 °F)
- Lightweight, pocket-sized
- Extendable probe
- Automatic POWER-OFF
- Incorporates Vaisala HUMICAP® Sensor that provides high accuracy, excellent long-term stability, neglible hysteresis, and insensitivity to dust and most chemicals
- Available in either °F or °C
- NIST traceable (certificate included)
- Each unit comes with a 9V battery, attached probe, 0.2 µm protective membrane filter and a carrying case



# Technical data

### Relative humidity

| | |
|---|---|
| Measurement range | 0 ... 100 %RH |
| Accuracy | ±2% (0 ... 90 %RH)<br>±3% (90 ... 100 %RH) |
| Resolution | 0.1 %RH |
| Temperature dependence | ±0.04 %RH/°C |
| Sensor type | HUMICAP®H thin film capacitive sensor |
| Response time (90%) | 15 s with membrane filter<br>5 s with plastic grid |

### Temperature

| | |
|---|---|
| Range | -20 ... +60 °C (-4 ... +140 °F) |
| Accuracy | ±0.3 °C (±0.54 °F) |
| Resolution | 0.1 °C (0.1 °F) |
| Temperature dependence | ±0.02 °C/°C (±0.02 °F/°F) |
| Sensor | Pt 100 IEC 751 1/3 Class B |

### General

| | |
|---|---|
| Display | 3 1/2 digit LCD |
| Hold function | Push-button hold of displayed value |
| Power supply | 9 V battery |
| Battery operation time | 50 h |
| Automatic POWER OFF | after 3 minutes, unless HOLD is activated |
| Operating temperature range | -20 ... +60 °C (-4 ... +140 °F) |
| Housing | ABC plastic |
| Sensor protection | |
| standard | plastic grid, part no. 6221 |
| optional | sintered filter 133 mm, part no. 0195 |
| Weight | 180 g with battery |
| Ordering Information | |
| HM34C | with °C temperature reading |
| HM34F | with °F temperature reading |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Portable Equipment |

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# Vaisala HUMICAP® Humidity and Temperature Transmitters HMT120 and HMT130

*The HMT120/130 with and without a display.*

The Vaisala HUMICAP® Humidity and Temperature Transmittersw HMT120 and HMT130 are designed for humidity and temperature monitoring in cleanrooms and are also suitable for demanding HVAC applications.

## Performance

The HMT120/130 incorporates Vaisala HUMICAP® technology that measures relative humidity accurately and reliably. The Vaisala HUMICAP® is resistant to dust and most chemicals.

The transmitter enclosure is optimized for use in cleanrooms. The smooth surface of the enclosure makes it easy to clean and the enclosure material is chosen to tolerate purifying agents. Furthermore, the cabling can be done through the back wall of the transmitter.

## Interchangeable Probe

The HMT120/130 transmitters use a fully interchangeable relative humity probe. The probe can be easily removed and replaced with a new one without having to adjust the transmitter, which allows for easy and quick recalibration of the transmitter. The probe can be adjusted using one of Vaisala's portable meters as a reference.

Also available is a constant output probe with fixed RH and T output for convenient inspection of the monitoring system and signal transfer line.

## Features/Benefits

- Vaisala HUMICAP® technology with humidity sensor HUMICAP® 180R
- 2-wire loop-powered or 3-wire voltage output configurations
- Interchangeable probe (easy field calibration)
- Accurate and reliable
- Resistant to dust and most chemicals
- Optional LCD display
- USB cable available for a PC connection for maintenance
- Wall-mounted or with a remote probe
- Constant output probe available
- Can be mounted outdoors using a Vaisala installation kit and the Vaisala Radiation Shield DTR502B
- Enclosure IP65
- Suitable for cleanrooms and demanding HVAC applications

## Available Options

The HMT120 and HMT130 transmitters are available as wall mounted or with remote probe. For high temperature applications or where space is limited, the remote probe is ideal. The transmitters come with an optional, LCD display, which shows the measurement results of selected parameters in selected units. The parameters are displayed simultaeously at two separate rows on the display.

# Technical Data

## Performance

| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Accuracy including non-linearity, hysteresis, and repeatability | |
| at 0 °C ... +40 °C | ±1.7 %RH (0 ... 90 %RH) |
| | ±2.5 %RH (90 ... 100 %RH) |
| at -40 °C ... +0 °C and | ±3.0 %RH (0 ... 90 %RH) |
| at +40 °C ... +80 °C | ±4.0 %RH (90 ... 100 %RH) |
| Factory calibration uncertainty at +20 °C (+68 °F) | ±1.5 %RH |
| Humidity sensor | Vaisala HUMICAP® 180R |
| TEMPERATURE | |
| Measurement range | -40 °C ... +80 °C |
| Accuracy over temperature range | |
| at +15 °C ... +25 °C | ±0.2 °C |
| at 0 ... +15 °C and at +25 °C ... +40 °C | ±0.25 °C |
| at -40 °C ... +0 °C and at +40 °C ... +80 °C | ±0.4 °C |
| Temperature sensor | Pt1000 RTD 1/3 Class B IEC 751 |
| Operating temperature range | |
| transmitter body, no display | -40 °C ... +60 °C |
| transmitter body, with display | -20 °C ... +60 °C |
| HMP110 probe | -40 °C ... +80 °C |
| Storage temperature range | -50 °C ... +70 °C |
| Electromagnetic compatibility | EN 61326-1 and EN 55022 |

## Inputs and outputs

| | |
|---|---|
| HMT120 TWO-WIRE TRANSMITTER (LOOP POWERED) | |
| Current output signals | 4 ... 20 mA |
| External loop voltage | 10 ... 30 VDC ($R_L$ = 0 ohms) |
| | 20 ... 30 VDC ($R_L$ < 500 ohms) |
| HMT130 THREE-WIRE TRANSMITTER | |
| Voltage output signals | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V |
| | or user defined between 0 ... 10 V |
| Min output resistance | 1 kohm |
| Serial output | RS485, non-isolated |
| Relay output | 1 relay (max. 50 VDC, 200 mA) |
| Supply voltage | 10 ... 35 VDC |
| | 15 ... 35 VDC (when output 0 ... 10 V) |
| | 24 VAC (±20 %) |
| Current consumption at 24 VDC | 8 mA, if relay closed 15 mA |
| Max. additional error caused by the analog outputs after calibration at +20 °C ambient temperature | ±0.1 % of FS output signal |
| Temperature dependence of the analog outputs | ±0.005 % of FS output signal |

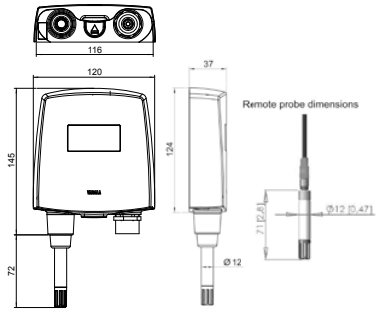
## Mechanics

| | |
|---|---|
| Material | |
| transmitter housing | PBT plastic |
| display window | PC plastic |
| probe body | Chrome coated aluminum |
| probe grid filter | Chrome coated ABS plastic |
| Housing classification | IP65 |
| Connections | |
| inputs and outputs | Screw terminals 0.5 ... 1.5 $mm^2$ |
| probe interface | 4-pin M8 female panel connector |
| Probe cable lengths | 3 m, 5 m, 10 m - up to 50 m |
| Display (optional) | 128 x 64 resolution full graphics B&W display without backlight |
| Weigth (including probe) | 270 g |

## Accessories

| | |
|---|---|
| Humidity and temperature probe | HMP110* |
| Humidity and temperature replacement probe | HMP110R* |
| Constant output probe | HMP110REF* |
| Humidity sensor | HUMICAP® 180R |
| Probe mounting flange | 226061 |
| Probe mounting clamps, 10 pcs | 226067 |
| HMP110 sensor protection | |
| plastic grid filter | DRW010522SP |
| plastic grid with membrane filter | DRW010525 |
| stainless steel sintered filter | HM46670SP |
| Probe cable 3 m | HMT120Z300 |
| Probe cable 5 m | HMT120Z500 |
| Probe cable 10 m | HMT120Z1000 |
| Radiation shield | DTR502B |
| Probe installation kit for DTR502 | 210623 |
| Rain shield with installation kit | 215109 |
| Duct installation kit | 215619 |
| HMI41 connection cable | 25917ZZ |
| HM70 connection cable | 211339 |
| USB serial interface cable | 219685 |

** See separate order form*

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# HMK15 Humidity Calibrator

three step plugs to fit all chamber holes (12 mm, 13.5 mm and 18.5 mm)
transit covers for secure transportation and long-term storage
thermometer with calibration certificate

*In addition to laboratory use,Vaisala Humidity Calibrator HMK15 is suitable for on-site checks of humidity probes and transmitters.*

## Features/Benefits

- Easy and reliable calibration of humidity probes and transmitters
- Based on saturated salt solutions
- Fast temperature equilibration
- No external power required
- Suitable for laboratory use and on-site checks
- Chambers and transit covers make HMK15 easy to transport
- Pre-measured certified salts available
- Vaisala Service Centers offer accredited calibrations for humidity, temperature and barometric pressure.

No measuring instrument stays accurate by itself. It is essential that the functioning of an instrument is periodically checked against a reference. Vaisala has developed the Vaisala Humidity Calibrator HMK15 to make calibration and spot checking of humidity probes and transmitters easy and reliable.

### Method used by leading laboratories

The operating principle of the HMK15 is based on the fact that a saturated salt solution generates a certain relative humidity in the air above it. The reading of the humidity probe or transmitter can then be adjusted accordingly. Many leading laboratories use this generally accepted and reliable method to calibrate humidity instruments. Usually two or three different salt solutions are used. Salts are chosen according to the application.

### Certified salts

The HMK15 can be ordered with certified and pre-measured salts. A sample calibration is made from each batch in Vaisala's Measurement Standards Laboratory (MSL).

### Calibrated thermometer

The HMK15 can be ordered with a thermometer, which is used for measuring the temperature during the calibration. It can also be used for checking the temperature measurement accuracy of the transmitter. The thermometer can contain either mercury (accuracy ±0.3 °C (±0.54 °F)) or red capillary fluid (accuracy ±1.0 °C (±1.8 °F)).

### FINAS approved Measurement Standards Laboratory

Vaisala's Measurement Standards Laboratory is a FINAS accredited calibration laboratory. FINAS is a member of the EA (the European Cooperation for Accreditation).

FINAS
Finnish Accreditation Service
K008 (EN ISO/IEC 17025)



# Technical data

## General

The standard HMK15 consists of the following parts:

- Two salt chambers, chamber covers and transit covers
- Base plate
- Choice of thermometers
  - mercury thermometer,Vaisala calibrated, order code 19728HM
  - thermometer with red capillary liquid, calibrated by manufacturer, order code 25130HM
- Measurement cup and mixing spoon

## Options

| Certified and ready dosed salts: | | Order code: | Total uncertainty*: |
|---|---|---|---|
| LiCl salt | 11 %RH | 19729HM | (±1.3%RH) |
| $MgCl_2$ salt | 33 %RH | 19730HM | (±1.2%RH) |
| NaCl salt | 75 %RH | 19731HM | (±1.5%RH) |
| $K_2SO_4$ salt | 97 %RH | 19732HM | (±2.0%RH) |

*Uncertainties given at +20 °C

| | |
|---|---|
| on exchanged water | 19767HM |
| Extra salt chambers | 19766HM |
| Carrying bag | HM27032 |

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# HMP155 Humidity and Temperature Probe

*HMP155 with a new, stable HUMICAP®180R sensor and an additional temperature probe.*

## New probe for reliability

The new Vaisala HUMICAP® Humidity and Temperature Probe HMP155 provides reliable humidity and temperature measurement.

## Long-term stability

The HMP155 has a new generation Vaisala HUMICAP®180R sensor that has excellent stability and withstands well harsh environments. The probe structure is solid and the sensor is protected with a sintered teflon filter, which gives maximum protection against liquid water, dust, and dirt.

## Warmed probe and high humidity environment

Measuring humidity reliably is challenging in environments where humidity is near saturation. Measurements may be corrupted by fog, mist, rain, and heavy dew. A wet probe may not give an accurate measurement in the ambient air.

This is an environment to which Vaisala has designed a patented, warmed probe for reliable measuring. As the sensor head is warmed continuously, the humidity level inside it stays below the ambient level. Thus, it also reduces the risk of condensation forming on the probe.

## Fast temperature measurement

What's more, with its fast response time, the additional temperature probe for the HMP155 is ideal for measurement in environments with changing temperatures.

### Features/Benefits

- Vaisala HUMICAP®180R sensor - superior long-term stability
- Optional warmed humidity probe
- Plug-and-play
- Chemical purge
- USB connection for service use
- Installation kits for DTR13 and DTR502 radiation shields and also for a Stevenson screen
- Weather-proof housing IP66
- New, fast temperature probe
- Different output possibilities: voltage, RS-485, resistive Pt100
- Applications: meteorological applications, aviation and road weather, instrumentation

## Long lifetime

Protecting the sensor from scattered and direct solar radiation, and precipitation will increase its lifetime. Thus, Vaisala recommends installing the HMP155 in one of the following radiation shields: DTR503, DTR13, or a Stevenson screen.

## Easy maintenance

The probe can be calibrated using a pc with a USB cable, with the push buttons, or with the MI70 indicator.



# Technical data

### Performance

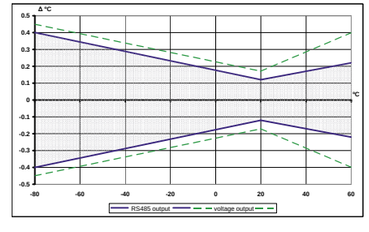
| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Accuracy (incl. non-linearity, hysteresis and repeatability) at | |
| +15 ... +25 °C (+59 ... +77 °F) | ±1 %RH (0 ... 90 %RH) |
| | ±1.7 %RH (90 ... 100 %RH) |
| -20 ... +40 °C (-4 ... 104 °F) | ±(1.0 + 0.008 x reading) %RH |
| -40 ... -20 °C (-40 ... -4 °F) | ±(1.2 + 0.012 x reading) %RH |
| +40 ... +60 °C (+104 ... +140 °F) | ±(1.2 + 0.012 x reading) %RH |
| -60 ... -40 °C (-76 ... -40 °F) | ±(1.4 + 0.032 x reading) %RH |
| Factory calibration uncertainty (+20 °C /+68 °F) | ±0.6 %RH (0 ... 40 %RH)* ±1.0 %RH (40 ... 97 %RH)* |
| * Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate. | |
| Recommended humidity sensor | HUMICAP®180R(C) |
| Response time at +20 °C in still air with a sintered PTFE filter | |
| 63 % | 20 s |
| 90 % | 60 s |
| TEMPERATURE | |
| Measurement range | -80 ... +60 °C (-112 ... +140 °F) |
| Accuracy with voltage output at | |
| -80 ... +20 °C | ±(0.226 - 0.0028 x temperature) °C |
| +20 ... +60 °C | ±(0.055 + 0.0057 x temperature) °C |
| passive (resistive) output according to IEC 751 1/3 Class B | ±(0.1 + 0.00167 x \|temperature\|)°C |
| RS485 output | |
| -80 ... +20 °C | ±(0.176 - 0.0028 x temperature) °C |
| +20 ... +60 °C | ±(0.07 + 0.0025 x temperature) °C |
| Accuracy over temperature range (opposite) | |
| Temperature sensor | Pt100 RTD 1/3 Class B IEC 751 |
| Response time with additional temperature probe in 3 m/s air flow | |
| 63 % | <20 s |
| 90 % | <35 s |
| OTHER VARIABLES | |
| dewpoint/frost point temperature, wet bulb temperature, mixing ratio | |

### General

| | |
|---|---|
| Operating temperature range | -80 ... +60 °C (-112 ... +140 °F) |
| Storage temperature range | -80 ... +60 °C (-112 ... +140 °F) |
| Connection | 8-pin male M12 connector |
| Connection cables | 3.5, 10, and 30 m |
| Cable material | PUR |
| Wire size | AWG26 |
| Service cables | USB connection cable<br>MI70 connection cable |
| Additional T probe cable length | 2 m |
| Housing material | PC |
| Housing classification | IP66 |
| Sensor protection | sintered PTFE |
| Weigth (probe) | 86 g |
| Electromagnetic compatibility: Complies with the EMC standard EN61326-1, Electrical equipment for measurement control and laboratory use - EMC requirement for use in industrial locations | |

### Inputs and outputs

| | |
|---|---|
| Operating voltage | 7 ... 28 VDC* |
| *Note: minimum operating voltage 12 V with 0 ... 5 V output and 16 V with 0 ... 10 V output, probe heating, chemical purge or XHEAT. | |
| Outputs | |
| voltage output | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V |
| resistive Pt100 (4-wire connection) | |
| RS485 | |
| Average current consumption (+15 VDC, load 100 kOhm) | |
| 0 ... 1 V output | <3 mA |
| 0 ... 10 V output | +0.5 mA |
| RS485 | <4 mA |
| during chemical purge | max. 110 mA |
| with warmed probe | max. 150 mA |
| Settling time at power-up | |
| voltage output | 2 s |
| RS485 | 3 s |

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# DTR500 Solar Radiation and Precipitation Shields

The Vaisala Radiation Shield Series DTR500 are solar radiation and precipitation shields support humidity probe installations in outdoor applications.

## Shield protects sensor

The maintenance-free DTR500 series shields protect the humidity and temperature sensors from solar radiation and precipitation. They provide excellent ventilation while blocking both direct and reflected solar radiation.

The special plastic used in the plates has excellent thermal characteristics; the white outer surface reflects radiation; the black inside absorbs accumulated heat. The shields can be easily installed on either a vertical pole, horizontal beam, or a flat surface.

The DTR Shields can be used with the following Vaisala probes:

- Vaisala HUMICAP® Humidity and Temperature Probe HMP155
- Vaisala HUMICAP® Humidity and Temperature Transmitter HMT337
- Vaisala HUMICAP® Humidity and Temperature Transmitter HMT100

## Choice of models and installation accessories

Two models are available:

- Nine-plate shield:
  Vaisala Radiation Shield DTR502B for HMT337, HMT100, PTU300 and HMP155's additional T probe
- Twelve plate shield:
  Vaisala Radiation Shield DTR503A for HMP155

*The Vaisala Solar Radiation Shield Series DTR500 are available in either a 9 or 12-plate, model.*

### Features/Benefits

- Protects temperature and humidity probes from scattered, as well as, direct solar radiation and rain.
- Maintenance-free
- Naturally ventilated
- Installs easily on a vertical pole, horizontal beam or flat surface
- Suitable for a wide range of applications
- Choice of shields and mounting accessories

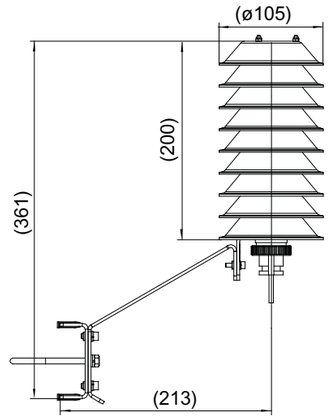


# Technical data

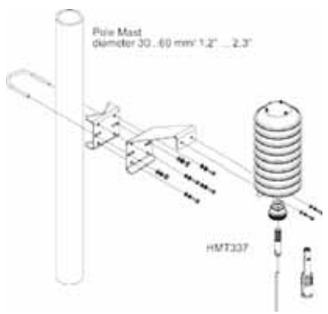
### Dimensions

Dimensions in mm.

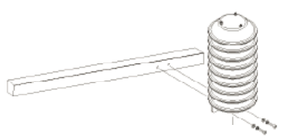
DTR502B
for HMT337, HMT100 and PTU300




DTR502B pole mast installation.



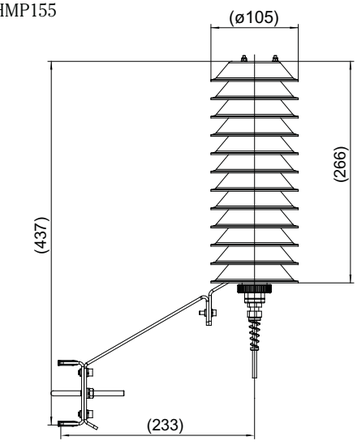

DTR502B horizontal beam installation.



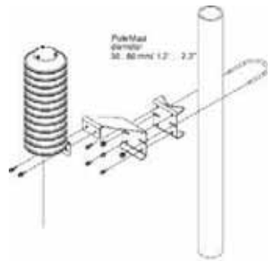
### Dimensions

Dimensions in mm.

DTR503A
for HMP155




DTR503A pole mast installation.



DTR503A horizontal beam installation.

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# HMD60UO/YO Outdoor Humidity and Temperature Transmitter & Solar Radiation Shield

*Vaisala HUMICAP® Humidity and Temperature Transmitter HMD60YO, combined with Vaisala Solar Radiation Shield DTR503B is easy to install and ideal for outdoor applications.*

## Features/Benefits

- Full 0 ... 100 %RH measurement
- Vaisala Solar Radiation Shield DTR503B provides excellent ventilation while blocking direct and reflected solar radiation, and precipitation
- True two-wire transmitter with 4 to 20 mA loop powered output: compatible with most energy management systems
- Electromagnetically compatible
- Temperature compensated
- Excellent long-term stability
- Negligible temperature coefficient
- ±2 % accuracy (0...90 %RH), ±3 % (90 % ... 100 %RH)
- NEMA 4 (IP65) housing

## Stable performance in demanding outside environments

The duct-mount Vaisala HUMICAP® Humidity and Temperature Transmitters HMD60UO and HMD60YO utilize Vaisala HUMICAP® Sensor. The Vaisala HUMICAP® Sensor is known for its excellent reliability, long-term stability, and reliable operation in humidity measurement. In addition, the sensors are insensitive to dust and most chemicals, and are not damaged by condensation. The transmitters feature two wire connections that make retrofitting, upgrading and installations easy.

## Fast, on-site calibration

The accuracy of the transmitters is easy to check by using Vaisala HUMICAP® Hand-Held Humidity Meter HM70. The calibration can be done in seconds with a single potentiometer – without disturbing the operation, thus ensuring accuracy and saving hours of maintenance time.

## Shield protects sensor

The maintenance-free, 12 plate Vaisala Solar radiation Shield DTR503B is naturally ventilated, and protects the sensors from scattered, as well as, direct solar radiation and rain.

The plates are composed of a special plastic material that offers excellent thermal characteristics and UV stabilized construction. The white outer surface reflects radiation, while the black inside absorbs accumulated heat, resulting in more accurate measurement.

## Easy-to-install

The easy-to-install DTR503B is suitable for a wide range of applications. It can be mounted on a vertical pole, horizontal beam or flat surface.

## HMD70UO/YO

Versatile alternatives to the HMD60UO/YO transmitters for outdoor applications are the HMD70UO/YO transmitters. These instruments feature selectable output signals of 0 … 1V, 0 … 5V, or 0 … 10V or 0 … 20mA. Powered by either AC or DC voltage, they are available with relative humidity only, or relative humidity and temperature sensors. They are also equipped with the radiation/precipitation shield.



# Technical data

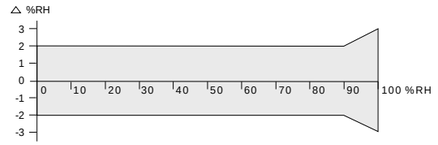
### General

| | |
|---|---|
| Supply voltage | 10 ...35 VDC ($R_L$ = 0 ohms)<br>20 ...35 VDC ($R_L$ = 500 ohms) |
| Output signal | 4 ...20 mA |
| Operating temperature range | |
| electronics | -40 … +60 °C (-40 … +140 °F) |
| sensor head | -40 … +60 °C (-40 … +140 °F) |
| Storage temperature range | -40 ...+80 °C (-40 ...+176 °F) |
| Connections | screw terminals 0.5 ... 1.5 mm² |
| Housing | |
| sensor head | stainless steel |
| electronics housing | cast aluminum |
| Sensor protection | membrane filter |
| optional | stainless steel sintered filter |

### Relative humidity

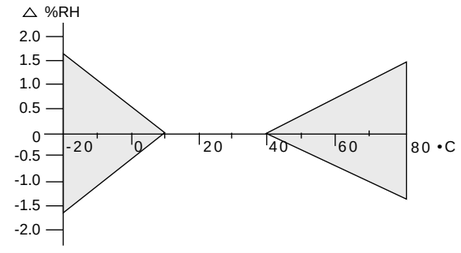
HMD60U AND HMD60Y

| | |
|---|---|
| Measurement range | 0 ... 100 %RH |
| Accuracy at +20 °C (+68 °F) | |




### Temperature dependence

| | |
|---|---|
| Response time at +20 °C (+68 °F) | 15 s with membrane filter |
| Sensor | HUMICAP® 180 |

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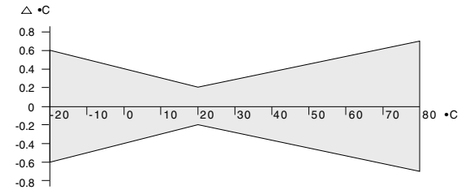
### Temperature (Y and T models only)

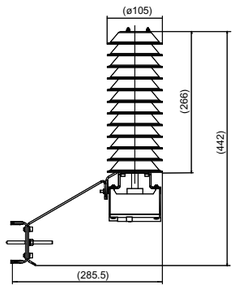
| | |
|---|---|
| Operating range | -40 … +60 °C (-40 … +140 °F) |



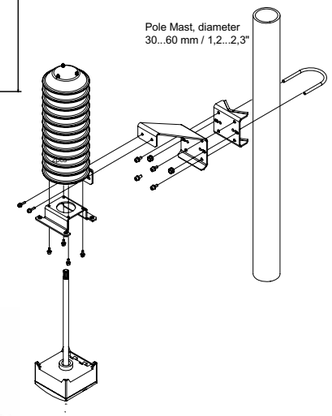

| | |
|---|---|
| Output signal | -40 … +60 °C (-40 … +140 °F) |
| Accuracy | |
| Linearity | better than 0.1 °C (0.18 °F) |
| Sensor | PT 1000 IEC 751 class B |

### Dimensions

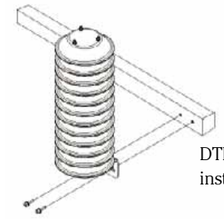
Dimensions in mm




DTR503B dimensions




DTR503B pole installation



DTR503B horizontal beam installation



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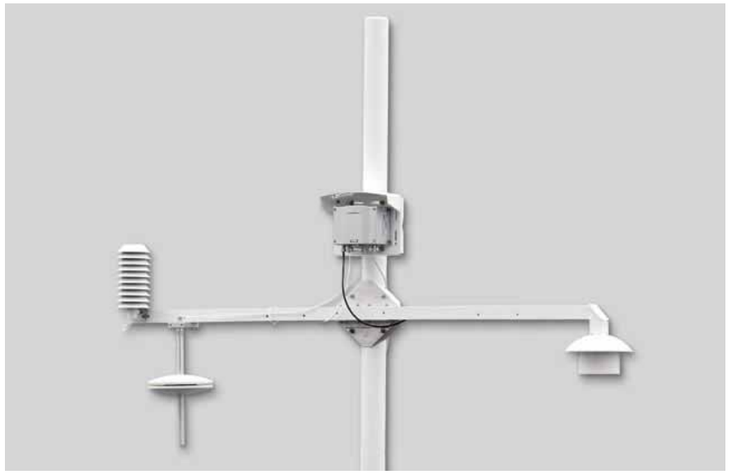
# HMT330MIK Meteorological Installation Kit



*The HMT337 and PTU307 feature warmed probe technology. Installed with the HMT330MIK kit either one forms the right choice for reliable humidity measurement in humid weather conditions.*

## Features/Benefits

- For outdoor humidity and temperature measurements
- Can be ordered in a variety of configurations
- Used together with HMT337 transmitter or PTU307
- Vaisala SPH 10/20 Static Pressure Head eliminates effectively pressure variations in the barometer caused by wind

**HMT337/PTU307 Features**

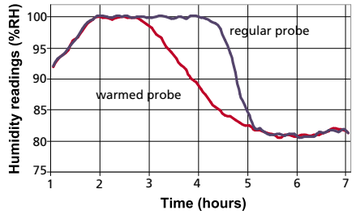
- Warmed probe provides truehumidity readings in condensing conditions
- Humidity measurement expressed as relative humidity and/or dewpoint temperature
- Easy field calibration with the HM70 hand-held meter

The Vaisala Meteorological Installation Kit HMT330MIK enables the Vaisala HUMICAP® Humidity and Temperature Transmitter HMT337 to be installed outdoors to obtain reliable measurements for meteorological purposes.

## True humidity readings in condensing conditions

In weather observations dew formation makes reliable humidity measurement difficult. When dew has formed on the humidity sensor, it is impossible to obtain a true reading until this dew evaporates.

Both the PTU307 and HMT337 avoid this problem by warming the probe. When warmed, the relative humidity inside the probe stays below the ambient level. With an accurate temperature measurement, the ambient dewpoint can be calculated precisely. To obtain the ambient relative humidity, an additional probe measures the ambient temperature,




*After a period of 100 % relative humidity, the warmed probe measures the true humidity, whereas the non-warmed probe takes time to recover from the condensation.*

and the transmitter calculates the relative humidity from the dewpoint and temperature values.

## Open shield prevents microclimates

The warmed probe of the HMT337/ PTU307 is mounted in a shield which is open at the bottom to ensure steady air circulation to the sensor even in calm weather.

In traditional radiation shields sleet or snow can accumulate on the shield and prevent the proper air circulation through the shield, and create a humid microclimate until the snow melts.

## Essential for critical weather measurements

Obtaining a true humidity reading is particularly important e.g. in traffic safety: at airports and at sea as well as on the roads. It is essential, for example, in fog and frost prediction.

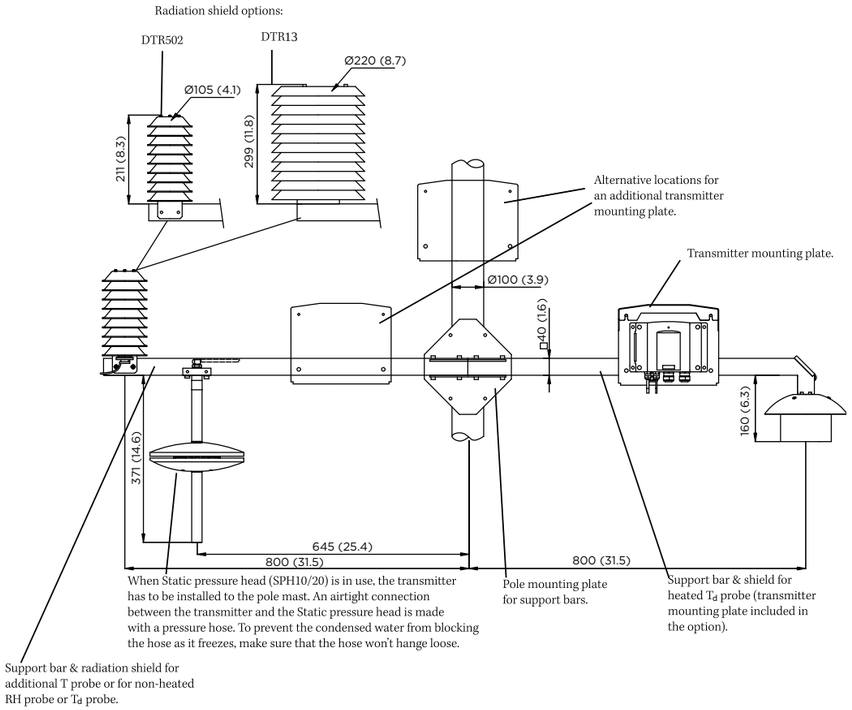
*For calibration, a portable HMP77 reference probe is easy to attach beside the HMT337 or PTU307 probe.*



# Technical data

## Dimensions

Dimensions in mm (inches)


Radiation shield options:
DTR502
DTR13
Ø105 (4.1)
Ø220 (8.7)
211 (8.3)
299 (11.8)
Alternative locations for an additional transmitter mounting plate.
Transmitter mounting plate.
Ø100 (3.9)
□40 (1.6)
160 (6.3)
371 (14.6)
645 (25.4)
800 (31.5)
800 (31.5)
When Static pressure head (SPH10/20) is in use, the transmitter has to be installed to the pole mast. An airtight connection between the transmitter and the Static pressure head is made with a pressure hose. To prevent the condensed water from blocking the hose as it freezes, make sure that the hose won't hange loose.
Pole mounting plate for support bars.
Support bar & shield for heated $T_d$ probe (transmitter mounting plate included in the option).
Support bar & radiation shield for additional T probe or for non-heated RH probe or $T_d$ probe.

## Order form

| | | | | | | |
|---|---|---|---|---|---|---|
| **Vaisala Meteorological Installation Kit** | | **HMT330MIK** | | | | |
| Support bar & shield for warmed Td probe | **No support bar & shield for warmed Td probe** | **0** | | | | |
| | *Support bar, transmitter mounting plate & shield for warmed Td probe* | *1* | | | | |
| Support bar and radiation shield for additional T probe or for non-warmed RH or Td probe | **No support bar or radiation shield** | | **A** | | | |
| | *Support bar with DTR502 shield for T probe* | | *B* | | | |
| | *Support bar with DTR13 shield for T probe* | | *C* | | | |
| | *Support bar with DTR502 shield for non-warmed RH or Td probe* | | *D* | | | |
| | *Support bar with DTR13 shield for non-warmed RH or Td probe* | | *E* | | | |
| Support bar mounting plate | **No mounting plate** | | | **0** | | |
| | *Pole mounting plate for support bar/bars* | | | *1* | | |
| Additional transmitter mounting plate | **No additional transmitter mounting plate** | | | | **A** | |
| | *Transmitter mounting plate for support bar assembly* | | | | *B* | |
| | *Transmitter mounting plate for pole assembly* | | | | *C* | |
| Static Pressure Head | **No Static Pressure Head** | | | | | **0** |
| | *Static Pressure Head SPH10* | | | | | *1* |

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# HMT300TMK Turbine Mounting Kit for Power Turbine Intake Air Measurement

*The Vaisala HUMICAP® Turbine Mounting Kit HMT300TMK is shown with the cover open.*

The Vaisala HUMICAP® Turbine Mounting Kit HMT300TMK is developed to monitor the air intake of gas and liquid fueled power turbines.

It is ideal for measuring in water vapor injection applications because the sensor has been optimized for high humidity environments by utilizing a patented, warmed probe. Water vapor is added to the intake of the turbine to increase the mass flow which in turn increases compression and electrical power output.

## Features/Benefits

- Designed for high humidity applications
- Measurement range: -40 ... +100°C
- Patented, warmed probe
- Incorporates Vaisala HUMICAP® Sensor for excellent accuracy and long-term stability and resistance to dust and most chemicals
- Low maintenance need
- Outer cover provides protection from rain and direct sunlight
- NIST traceable (certificate included)

## Low maintenance

Power turbines also require exact water vapor injection in the chamber to reduce pollutant emissions. Vaisala's warmed probe technology is ideal because of its reliability in the field. In fact, the only suggested scheduled maintenance is annual calibration.

## Patented, warmed probe prevents condensation

The HMT300TMK with the HMT337 installed, provides fast and reliable dewpoint measurement especially under high humidity conditions where dew would normally form on the humidity sensor and thereby cause errors in measurement. The patented warmed probe prevents condensation from forming on the sensor.

## Protective enclosure

The HMT300TMK includes a white, painted aluminum enclosure with an installation kit for the probe. The HMT337 Humidity and Temperature Transmitter is installed in the aluminum enclosure at the factory. The instrument can be equipped to be powered with either 24 VDC/VAC or with an internal 110/230 volt power supply unit.

The outer cover protects the transmitter from direct sun light and rain. The installation kit protects the probe from outer water splashes, keeps the sensor dry, and prevents any parts that could vibrate loose from entering the turbine.

The HMT300TMK can be ordered separately for installation with the customer's existing HMT337.

## HUMICAP® performance

The HMT330 Series Transmitters are fitted with the latest generation of the HUMICAP®, the polymer sensor known for its accuracy, reliability and long-term stability. The sensor has a high tolerance for particulate abrasion and chemical contamination.

## Vaisala HUMICAP® Humidity and Temperature Transmitter HMT337

The HMT337 is intended for demanding industrial humidity measurement applications with a risk of condensation. The stainless steel probe is mechanically durable and preferred for most industrial applications.

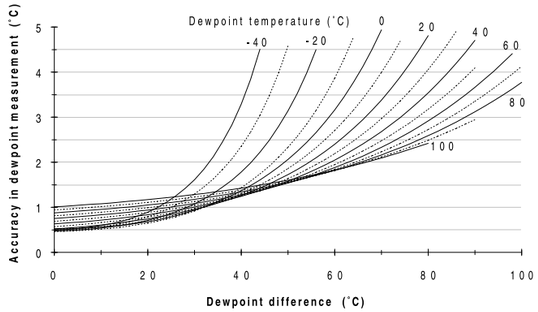


# Technical data

## Dewpoint temperature

| | |
|---|---|
| Measurement range | -40 ...+100 °C (-40 … +212 °F) |

Accuracy: find the intersection of the dewpoint temperature curve and the dewpoint difference reading (process temperature - dewpoint temperature) on the x-axis and read the accuracy in dewpoint measurement at the y-axis




| | |
|---|---|
| Response time (90 %) at +20 °C (68 °F) in still air (PPS grid with steel netting) | 20 s |
| Sensor | HUMICAP® 180C |

## General

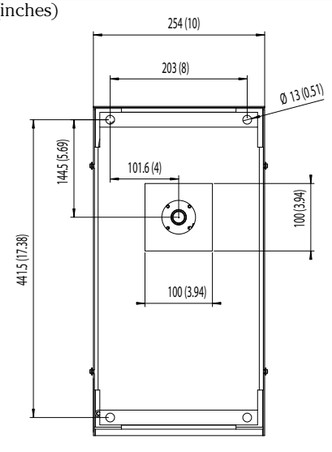
| | |
|---|---|
| Connections | screw terminals for 0.5 mm² wires (AWG 20), stranded wires recommended |
| Operating voltage | 24 VDC/VAC (20...28 V) or 115/230 VAC (Must be specified at time of order) |
| Recommended external load for current outputs | < 500 ohm |
| 0...1 V output | > 2 kohm (to ground) |
| 0...5 & 0...10 V outputs | > 10 kohm (to ground) |
| Operating temperature range for electronics | -40...+60 °C (-40 ...+140 °F) |
| Storage temperature | -55...+80 °C (-67 ...+176 °F) |
| Housing material | G-AlSi10 (DIN 1725) |
| Housing classification | IP65 (NEMA 4) |
| Bushing | 8...11 mm diameter cables (0.31 ...0.43 inch) |
| Humidity sensor protection (Ø 12 mm) | PPS grid with steel netting |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Industrial Environment |

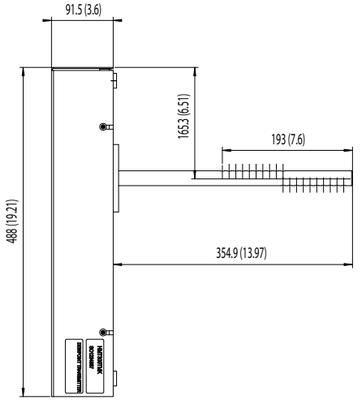
## Outputs

| | |
|---|---|
| Two standard outputs, third optional | 0...20 mA, 4...20 mA, 0 ...1 V, 0...5 V, 0 ... 10 V |
| Typical accuracy of analog output at +20 °C (+68 °F) | ±0.05 % full scale |
| Typical temperature dependence of analog output | ±0.005 %/°C full scale |
| Serial output available | RS232C (optional RS485) |

## Dimensions

Dimensions in mm (inches)

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# Vaisala INTERCAP® Humidity and Temperature Transmitter Series HMW80

*The HMW80 combines excellent stability with easy installation and reliable operation.*

## Features/Benefits

- Cost-efficient, dependable solution for humidity and temperature measurement for heating and ventilation
- Measurement range 0 ... 100 %RH and -5 ... +55 °C
- Stable and dependable
- Combines excellent stability with easy installation and reliable operation
- Fits EU/US/JPN junction boxes
- 2-year warranty
- No recalibration required
- UL-V0 approved materials used

The two- and three-wire Vaisala INTERCAP® Humidity and Temperature Transmitter Series HMW80 is designed for use in energy management systems in buildings. They combine excellent stability with reliable operation. The HMW80 is easy to install: wire it to the terminal block at the transmitter bottom and close the housing with a snap-on lid to cover the electronics.

## Low Maintenance Costs

The HMW80 humidity transmitters use the Vaisala INTERCAP® Sensor – an interchangeable capacitive humidity sensor. The transmitters require no recalibration if the sensor is changed. This means great savings in overall maintenance costs. The sensor is also insensitive to dust as well as to most chemicals.

## Measures Both Humidity and Temperature

The HMW80 transmitters are available in four models: HMW82 and HMW83 transmitters measure both humidity and temperature. They measure humidity with a ±3 %RH accuracy and with a stability of ±3 %RH over 5 years. The accuracy of the temperature measurement is ±0.5 °C. Two other models, TMW82 and TMW83, measure temperature only.

Both 2- and 3-wire transmitters are also available: HMW82 and TMW82 are 2-wire (4 … 20 mA loop powered) transmitters, and HMW83 and TMW83 are 3-wire (0 … 10 V) transmitters.

# Technical Data

## Performance

| | |
|---|---|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Accuracy | |
| Temperature range | 10 ... 30 °C |
| 30 ... 70 %RH | ±3 %RH |
| | 0 ... 30 %RH, 70 ... 100 %RH ±5 %RH |
| Temperature range | -5 ... +10 °C, +30 ... + 55 °C |
| 0 ... 100 %RH | ±7 %RH |
| Stability | ±3 %RH / 5 years |
| Humidity sensor | Vaisala Intercap® |
| TEMPERATURE | |
| Measurement range | -5 ... +55 °C |
| Accuracy | |
| +10 ... +30 °C | ±0.5 °C |
| -5 ... +10 °C, +30 ... +55 °C | ±1.0 °C |
| Temperature sensor | Digital temperature sensor |

## Operating environment

| | |
|---|---|
| Operating temperature range | -5 ... +55 °C |
| Storage temperature range | -40 ... +60 °C |
| Electromagnetic compliance | complies with EMC standard EN61326-1, Light industrial Environment |

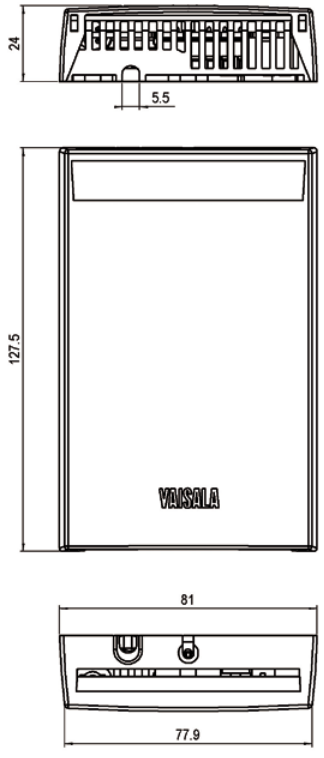
## Inputs and outputs

| | |
|---|---|
| HMW82, TMW82 | |
| Outputs | 4 ... 20mA, loop powered |
| Loop resistance | 0 ... 500 Ohm |
| Supply voltage | 10 ... 28 VDC |
| HMW83, TMW83 | |
| Outputs | 0 ... 10V |
| Load resistance | 10 kohm min |
| Supply voltage | 15 ... 35 VDC / 24 VAC ±20 % |

## Mechanics

| | |
|---|---|
| IP class | IP30 |
| Housing colour | RAL9003 |
| Housing material | ABS/PC |
| | UL-V0 approved |

## Dimensions

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# HMD42/53 Humidity and Temperature Transmitters for Ducts in Commercial HVAC Applications

## Features/Benefits

- Designed for building automation applications
- ±3 %RH accuracy
- Full 0 ... 100 %RH measurement range
- -20 ... +60 °C (-4 ... +140 °F) operating range
- IP65 (NEMA 4) metal housing
- Excellent stability and high reliability
- Fully interchangeable Vaisala INTERCAP® Sensor
- Variety of analog signal outputs available

The duct mounted Vaisala INTERCAP® Humidity and Temperature Transmitters HMD42 and HMD53 are designed for building automation applications. They combine reliable operation with excellent stability, providing low cost of ownership to the user.

### Flexibility in Humidity and Temperature Measurement

The HMD42/53 transmitters measure humidity with a ±3 %RH accuracy and temperature with a ±0.4 °C (±0.72 °F) accuracy. They feature various selectable analog output signals and they can be powered by either AC or DC voltage.

### Easy Maintenance

The HMD42/53 humidity transmitters use Vaisala INTERCAP® Sensor - the interchangeable capacitive humidity sensor. The transmitters require no recalibration if the sensor is changed. This means great savings in overall maintenance costs.

### Reliable Performance in Harsh Environments

The duct mount HMD42/53 transmitters can be installed in various measurement environments due to the robust IP65 (NEMA4) rated metal enclosure, which protects the sensor from dust and splashes of water. The wide measurement temperature range from -20 °C to +60 °C (-4 ... +140 °F) covers most HVAC applications.

## Typical Applications

- Office buildings
- Retail spaces
- Governmental buildings
- Educational facilities
- Sport and event complexes
- Hotels and conference centers
- Airports
- Metro stations

# Technical Data

## Relative Humidity

| | |
|---|---|
| Measurement range | 0 ... 100 %RH |
| Typical accuracy | |
| Temperature range | 0 ... +40 °C (+32 ... +104 °F) |
| 0 ... 90 %RH | ±3 %RH |
| 90 ... 100 %RH | ±5 %RH |
| Temperature range | -20 ... 0 °C, +40 ... +60 °C |
| | (-4 ... +32 °F, +104 ... +140 °F) |
| 0 ... 90 %RH | ±5 %RH |
| 90 ... 100 %RH | ±7 %RH |
| Humidity sensor | Vaisala INTERCAP® |
| Stability | ±2 %RH / 2 years |
| Response time at 20 °C (+68 °F), 90 % response | 15 s |

## Temperature

| | |
|---|---|
| Measurement range | -20 ... +60 °C (-4 ... +140 °F) |
| Output scale | -40 ... +60 °C (-40 ... +140 °F) |
| Accuracy | |
| 0 ... +40 °C (+32 ... +104 °F) | ±0.4 °C (±0.72 °F) |
| -20 ... 0 °C, +40 ... +60 °C | |
| (-4 ... +32 °F, +104 ... +140 °F) | ±0.6 °C (±1.1 °F) |
| Sensor | Pt1000 IEC 751 Class B |

## General - HMD42

| | |
|---|---|
| Supply voltage | 10 ... 35 VDC ($R_L$ = 0 ohm) |
| | 20 ... 35 VDC ($R_L$ = 500 ohm) |
| Output signal | 4 ... 20mA |

## General - HMD53

Supply voltage range depends on the selected output signal

| | DC | AC |
|---|---|---|
| 0 … 1V | 10 … 35V | 9 … 24V |
| 0 … 5V | 14 … 35V | 12 … 24V |
| 0 … 10V | 19 … 35V | 16 … 24V |
| WITH OPTIONAL CURRENT MODULE | | |
| 0 ... 20 mA ($R_L$ = 0 ohm) | 10 … 35V | 11 … 24V |
| **0 … 20 mA ($R_L$=500 ohm) | 20 … 35V | 17 … 24V |
| Power consumption @ 24VAC | | 12mA typical |

**Optional temperature scales are available on request.

## General

| | |
|---|---|
| Operating temperature range | |
| electronics | -5 ... +55 °C (+23 ... +131 °F) |
| probe | -20 ... +60 °C (-4 ... +140 °F) |
| Storage temperature range | -40 ... +60 °C (-40 ... +140 °F) |
| Maximum flow speed | 50 m/s |
| Housing material | |
| probe | stainless steel |
| electronics | cast aluminium |
| Housing classification | IP65 (NEMA 4) |
| Connections | screw terminal 0.5 ... 1.5 mm² |
| Cable thread-through bushing for 7 ... 10 mm | |
| (PG9) included | (18941HM) |
| Complies with EMC standard EN61326 and EN55022 | |

## Accessories

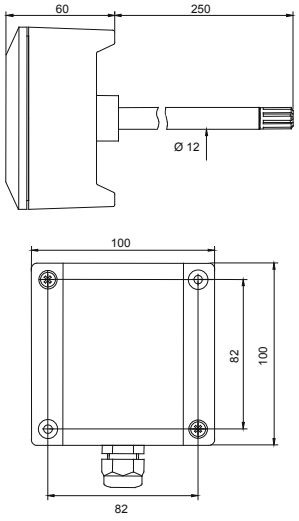
| | |
|---|---|
| Armoured cable gland | 10528HM |
| Current module (for HMD53) | 18945HM |

## Spare Parts

| | |
|---|---|
| Vaisala INTERCAP sensor, 1 piece | 15778HM |
| Vaisala INTERCAP sensor, 10 pcs | INTERCAPSET-10PCS |
| Membrane filter | DRW010525 |
| Sintered filter | HM46670SP |

## Dimensions

Dimensions in mm

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# DMT340 Series Dewpoint and Temperature Transmitters for very dry conditions

*The display shows measurement trends, real time data and history.*

## Features/Benefits

- Measures dew points from -60 °C to +80 °C (-76 ... +176 °F) with the accuracy of ±2 °C (±3.6 °F)
- Vaisala DRYCAP® Sensor provides accurate, reliable measurement with excellent long-term stability and fast response
- Withstands condensation
- Unique auto-calibration feature
- Optional alarm relays, local display and mains power supply module
- Compatible with Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70
- NIST traceable (certificate included)
- 3 analog outputs and a serial interface, WLAN/LAN

The Vaisala DRYCAP® Dewpoint and Temperature Transmitter Series DMT340 is designed for industrial low humidity applications. Typical applications include compressed air drying and metal treatment. The device is very reliable, easy to use and economical to maintain.

### Stability in low dew points

The Vaisala DRYCAP® Sensor is immune to particulate contamination, water condensation, oil vapor and most chemicals. Since the sensor withstands condensation, its performance is unmatched for low dew point applications that experience water spikes in the process. The sensor recovers rapidly from contact with free water.

### Patented auto-calibration

The stability of the DMT340 is due to the unique auto-calibration function, patented by Vaisala.

The auto-calibration makes the transmitter perform a calibration and adjustment by itself while the measured process is running. If the measurement accuracy is not confirmed, corrections are made automatically. The procedure is so quick and corrections are so minor that it will go unnoticed. This ensures low maintenance and high performance. To continue performance at the highest level, the transmitter can be sent to Vaisala for a NIST traceable calibration. Calibration intervals depend on the application; in normal conditions, a NIST traceable calibration in every two years is recommended.

### Graphical measurement trend and history display

The DMT340 can be ordered with a large numerical and graphical display with a multilingual menu. It allows the user to monitor measurement trends and one-year history.

The optional data logger with real-time clock makes it possible to generate more than four years of measured history and zoom in on any desired time or time frame.

The display alarm allows tracking of any measured parameter, with a freely configurable low and high limit.

### Versatile outputs and (wireless) data collection

The DMT340 can be connected to a network with an optional (W)LAN interface, which enables a (wireless) Ethernet connection.

For serial interface also the USB connection, RS232 and RS485 can be used. Additionally an alarm relay option is available.

The transmitter can have up to three analog outputs. Galvanic isolation of supply power and analog outputs are also offered.

The recorded measurement data can be viewed on the display or transferred to a PC with Microsoft Windows® software.

### Easy installation

The DMT340 has a variety of features to choose from. Units are delivered installation-ready.

*The Vaisala DRYCAP® HandHeld Dewpoint Meter DM70 is ideal for field checking DMT340 transmitters.tt*

*The DMT342 probe is installed using a flange or sampling cell.The small probe is ideal for integrating into larger equipment.*

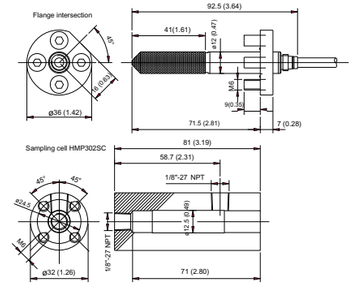
**Probe specifications**

**DMT342 with Small Size Flanged Probe**

| | |
|---|---|
| Pressure range | 0 ...50 bar/0 ...725 psia |
| Mechanical durability | up to 250 bar/ 3625 psia |
| Probe diameter | 12 mm/0.5 inch |
| Installation | |
| Flange | 36 mm/1.4 inch |
| Sampling cell | HMP302SC |

**Dimensions**

Dimensions in mm (inches)



*The DMT344 features a threaded connection for extended pressures with different fitting body options. It is ideal for permanent installations into pressurized or vacuum processes.*

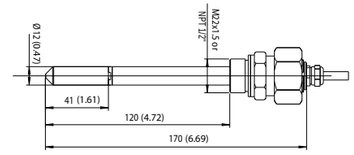
**Probe specifications**

**DMT344 with Probe for High Pressures**

| | |
|---|---|
| Pressure range | 0 ...50 bar/0 ...725 psia |
| Mechanical durability | up to 100 bar/ 1450 psia |
| Probe diameter | 12 mm/0.5 inch |
| Installation | |
| Fitting Body | M22 x 1.5 |
| Fitting Body | NPT 1/2" |

**Dimensions**

Dimensions in mm (inches)



*The DMT347 probe is ideal for tight spaces with thread connection.The small probe is installed using the Swagelok® connectors.*

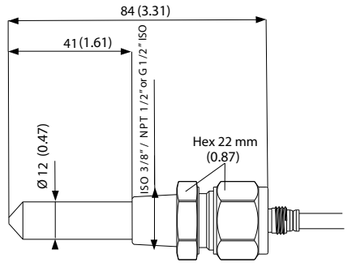
## Probe specifications

**DMT347 with Small Sized Probe**

| | |
|---|---|
| Pressure range | 0 ... 10 bar/0 ... 145 psia |
| Mechanical durability | up to 100 bar/ 145 psia |
| Probe diameter | 12 mm/0.5 inch |
| Installation | |
| Fitting Body | R 3/8" ISO |
| Fitting Body | G 1/2" ISO |
| Fitting Body | NPT 1/2" |

## Dimensions

Dimensions in mm (inches)



*The DMT348 is ideal for installations in pressurized processes where the probe needs to be removed while the process is running.The probe depth is adjustable.*

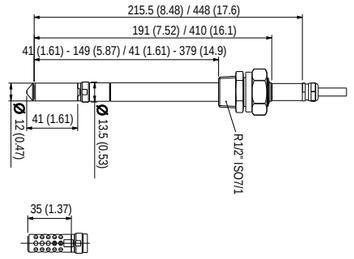
## Probe specifications

**DMT348 with Probe for Pipeline Installations**

| | |
|---|---|
| Pressure range | 0 ... 40 bar/0 ... 580 psia |
| Adjustable length | 41 ... 149/371 mm/ 1.61 ... 5.87/14.6 inch |
| Installation | |
| Fitting Body | R1/2" ISO |
| Fitting Body | NPT 1/2" |
| Ball Valve Set | BALLVALVE-1 |
| Sampling Cell | DMT242SC or DMT242SC2 |

## Dimensions

Dimensions in mm (inches)



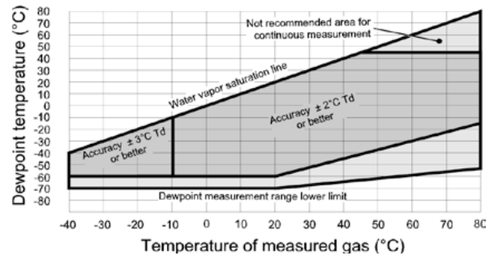

*Optional filter for low pressures (for all models)*



# Technical data

## Measured parameters

| | |
|---|---|
| DEW POINT | |
| Sensor | Vaisala DRYCAP®180M |
| Measurement range | -60 ...+80 °C (-76 ...+176 °F) Td |
| For continuous use | -60 ...+45 °C (-76 ...+113 °F) Td |
| Accuracy | |
| up to 20 bar/290 psia | ±2 °C/±3.6 °F see the accuracy graph below |
| 20 ... 50 bar/290 ... 725 psia | additional inaccuracy +1 °C Td |


Dewpoint temperature (°C)
Temperature of measured gas (°C)
Not recommended area for continuous measurement
Water vapor saturation line
Accuracy ± 2°C Td or better
Accuracy ± 3°C Td or better
Dewpoint measurement range lower limit

| | |
|---|---|
| Dew point accuracy vs. measurement conditions | |
| Response time | 63% [90%] at +20°C gas temperature |
| Flow rate | 1 l/min and 1 bar pressure |
| -60 ...-20 °C Td (-76 ...-4 °F Td) | 5s [10s] |
| -20 ...-60 °C Td (-4 ...-76 °F Td) | 45s [10min] |
| TEMPERATURE | |
| Measurement range | 0 ...+80 °C (+32 ...+176 °F) |
| Accuracy | ±0.2 °C at room temperature |
| Temperature sensor | Pt 100 IEC 751 1/3 class B |
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 70 %RH |
| Accuracy (RH <10 %RH, at + 20 °C) | ±0.004 %RH + 20 % of reading |
| PPM | |
| Measurement range (typical) | 10 ... 2500 ppm |
| Accuracy (at + 20 °C, 1 bar) | 1 ppm + 20 % of reading |

Other measurement parameters available (depends on model) mixing ratio, absolute humidity, pressure dew point calculated to 1 bar, temperature difference (T-Td), water vapor pressure

## Operating environment

| | |
|---|---|
| Operating temperature | |
| for probes | -40 ...+80 °C (-40 ...+176 °F) |
| Mechanical durability | Up to +180 °C (+356 °F) |
| for transmitter body | -40 ...+60 °C (-40 ...+140 °F) |
| with display | 0 ...+60 °C (+32 ...+140 °F) |
| Storage temperature range | -55 ...+80 °C (-67 ...+176 °F) |
| Pressure range for probes | See probe specifications |
| Sample flow rate | No effect |
| Measured gases | non corrosive |

Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial environment.

## Inputs and outputs

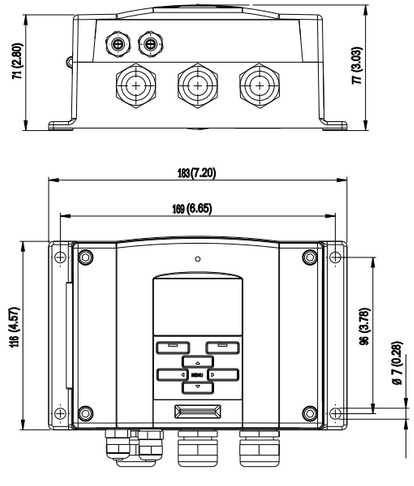
| | |
|---|---|
| Operating voltage | 10 ... 35 VDC, 24 VAC |
| with optional power supply module | 100 ... 240 VAC 50/60 Hz |
| Power consumption @ 20 °C ($U_{in}$ 24VDC) | |
| RS-232 | max 25 mA |
| $U_{out}$ 2 x 0...1V / 0...5V / 0...10V | max 25 mA |
| $I_{out}$ 2 x 0...20 mA | max 60 mA |
| display and backlight | + 20 mA |
| during sensor purge | + 110 mA max |
| Analog outputs (2 standard, 3rd optional) | |
| current output | 0 ... 20 mA, 4 ... 20 mA |
| voltage output | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V |
| Accuracy of analog outputs at 20 °C | 0.05 % full scale |
| Temperature dependence of the analog outputs | ± 0.005 %/°C full scale |
| External loads | |
| current ouputs | $R_L$ < 500 ohm |
| 0 ... 1V output | $R_L$ > 2 kohm |
| 0 ... 5V and 0 ... 10V outputs | $R_L$ > 10 kohm |
| Max wire size | 0.5 mm² (AWG 20) stranded wires recommended |
| Digital outputs | RS-232, RS-485 (optional) |
| Service connection | RS-232, USB |
| Relay outputs | 0.5 A, 250 VAC, SPDT (optional) |
| Ethernet interface (optional) | |
| Supported standards | 10/100Base-T |
| Connector | RJ45 |
| Protocols | Telnet |
| WLAN interface (optional) | |
| Supported standards | 802.11b |
| Antenna connector type | RP-SMA |
| Protocols | Telnet |
| Security | WEP 64/128, WPA |
| Authentication / Encryption | |
| Open / no encryption | |
| Open / WEP | |
| WPA Pre shared key / TKIP | |
| WPA Pre shared key / CCMP (a.k.a. WPA2) | |
| Optional data logger with real-time clock | |
| Logged parameters | max. three with trend/min/max values |
| Logging interval | 10 sec (fixed) |
| Max. logging period | 4 years 5 months |
| Logged points | 13,7 million points per parameter |
| Battery lifetime | min. 5 years |
| Display | LCD with backlight, graphic trend display of any parameter |
| Display menu languages | English, Chinese, Spanish, German, French, Japanese, Russian, Swedish, Finnish |

## Mechanics

| | |
|---|---|
| Cable bushing | M20x1.5 for cable diameter 8 ... 11mm/0.31 ... 0.43” |
| Conduit fitting | 1/2”NPT |
| User cable connector (optional) | M12 series 8 pin (male) |
| option 1 | with plug (female) with 5 m / 16.4 ft black cable |
| option 2 | with plug (female) with screw terminals |
| USB-RJ45 Serial Connection Cable | order no. 219685 |
| Probe cable diameter | 5.5 mm |
| Probe cable lengths | 2 m, 5 m or 10 m |
| Housing material | G-AlSi 10 Mg (DIN 1725) |
| Housing classification | IP 65 (NEMA 4X) |

## Dimensions

Dimensions in mm (inches)




DRYCAP® is a registered trademark of Vaisala.

TYPE APPROVED PRODUCT
CERTIFICATE NO.: A-11440

VAISALA

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www.vaisala.com or contact
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# Ensure dry compressed air with dewpoint measurement

**Vaisala innovated DRYCAP® dewpoint instruments have been developed for the most demanding conditions.**

- Fastest wet-to-dry response time on the market - just minutes
- High resistance to contamination - immune to compressor oil
- Complete recovery from saturated conditions
- Long 2-year calibration interval

**Want to know more? Our experts welcome your most difficult questions.**

www.vaisala.com/compressedair sales@vaisala.com VAISALA

# DMT345 and DMT346 Dewpoint Transmitters for High Temperature Applications

*The Vaisala DRYCAP® Dewpoint Transmitters DMT345 and DMT346 are designed to measure and control humidity especially in dry environments with high temperatures.*

## Features/Benefits

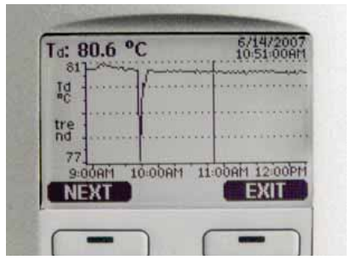
- The DMT345 measures humidity in temperatures up to 180 °C (356 °F)
- The DMT346 measures humidity in temperatures up to 350 °C (+662 °F)
- Dewpoint accuracy ±2 °C (±3.6 °F)
- Vaisala DRYCAP® Sensor provides accurate, reliable measurement with excellent long-term stability and fast response
- Withstands condensation
- Unique auto-calibration feature
- Optional local display with keypad, mains power supply module and alarm relays
- NIST traceable calibration (certificate included)
- Analog outputs, WLAN/LAN

The Vaisala DRYCAP® Dewpoint Transmitters DMT345 and DMT346 are designed for humidity measurement in industrial drying applications with particularly high temperatures.

Both transmitters incorporate the Vaisala DRYCAP® sensor, which is accurate, reliable, and stable. The sensor withstands condensation and is immune to particulate contamination, oil vapor and most chemicals. The DRYCAP® sensor stands out for its swift response time and rapid recovery after getting wet.

## Measure humidity directly in hot processes

The DMT345 and DMT346 are constructed for direct measurement in hot processes. Therefore, there is no need for sampling systems and trace heating. As a result, high accuracy and constancy are maintained.




*The large and clear display allows the user to check data at a glance.*

The accuracy and stability of the DMT345 and the DMT346 are due to the unique auto-calibration function, patented by Vaisala. This auto-calibration makes the transmitter perform a calibration and adjustment by itself while the measured process is running. If the measurement accuracy is not confirmed, corrections are made automatically. The procedure is so quick and corrections are so minor that it will go unnoticed. This ensures low maintenance and high performance. In normal conditions, it is recommended to have a traceable calibration performed once a year.

## DMT345, Accurate in hot and dry environments

The DMT345 is designed for accurate humidity measurement in hot and dry conditions. This model provides unmatched dry end measurement accuracy in temperatures up to 140 °C, however the DMT345 can operate safely in temperatures up to 180 °C.

The stainless steel probe is especially designed for high temperatures and has an optional installation flange that allows an adjustable installation depth and therefore a precise positioning.



## DMT346, Reliable in very hot processes

When process temperatures range between 140 °C to 350 °C, the DMT346 provides the best measurement performance.

The DMT346 comes with a cooling set as a standard feature. The cooling effect may be regulated by adding the cooling fins, or removing them from the set for the best measurement performance.

The cooling system operates without moving parts, additional power or cooling utilities, thereby eliminating the risk of sensor damage due to a mechanical cooling failure.

Additionally, sensor warming minimizes the risk of condensing on the sensor. In low humidity the combination of auto-calibration and DRYCAP® ensures accurate measurement.

## Graphical display

The DMT345 and DMT346 transmitters can be ordered with a large numerical and graphical display, which allows the user to clearly monitor operational data, measurement trends and up to one-year measurement history.

The optional data logger with real-time clock makes it possible to generate more than four years of the measured history and zoom in on any desired time or time frame.

## Versatile outputs and (wireless) data collection

The transmitter can be connected to a network with an optional (W)LAN interface, which enables a (wireless) Ethernet connection.

For serial interface also the USB connection, RS232 and RS485 can be used. Additionally an alarm relay option is available.

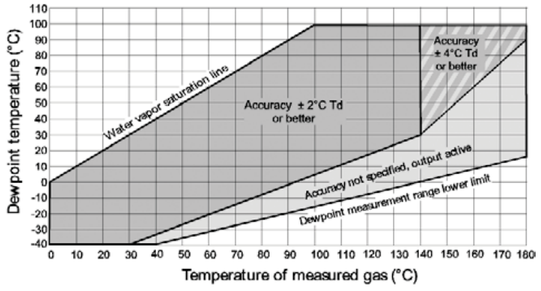
The transmitter can have up to three analog outputs. Galvanic isolation of supply power and analog outputs are also offered. The recorded measurement data can be viewed on the display or transferred to a PC with Microsoft Windows® software.

Units are delivered installation-ready and meet ROHS requirements.

# Technical data

### Measured variables DMT345

| DEWPOINT DMT345 | |
|---|---|
| Sensor | Vaisala DRYCAP®180S |
| Measurement range | -40 ...+100 °C (-40 ...+212 °F) Td |
| Accuracy | ±2°C (±3.6 °F) Td |
| | See the accuracy graph below |


Dewpoint temperature (°C)
Temperature of measured gas (°C)
Water vapor saturation line
Accuracy ± 2°C Td or better
Accuracy ± 4°C Td or better
Accuracy not specified, output active
Dewpoint measurement range lower limit

*Dewpoint accuracy vs. measurement conditions*

| | |
|---|---|
| Response time 63 % [90 %] flow rate 1 l/min and 1 bar pressure | |
| from dry to wet | 5s [10 s] |
| from wet to dry including auto-calibration | 45s [5 min] |

| TEMPERATURE DMT345 | |
|---|---|
| Measurement range | 0 ...+180 °C (+32 ...+356°F) |
| with sensor warming | upper range limited by humidity (at 80% RH warming is switched on and T reading not actual process Temperature) |
| Accuracy | ±0.4 °C at 100 °C |
| Temperature sensor | Pt 100 IEC 751 1/3 class B |

| RELATIVE HUMIDITY DMT345 | |
|---|---|
| Measurement range | 0 ... 100 % RH |
| with sensor warming | 0 ... 80 % RH |
| Accuracy | |
| below 10 % RH | ±10 % of reading |
| above 10 % RH | ±1,5% RH + 1,5 % of reading |

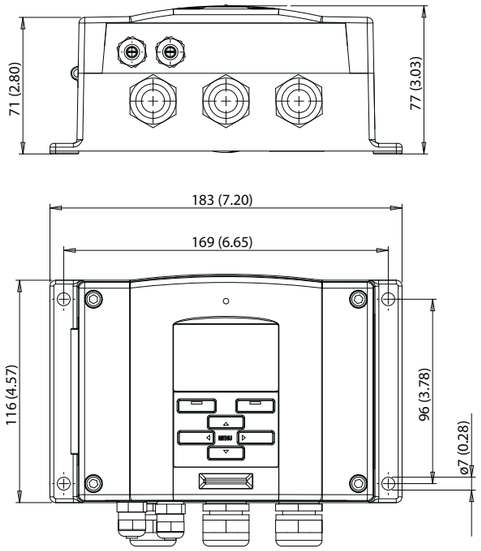
| MIXING RATIO DMT345 | |
|---|---|
| Measurement range (typical) | 0 ... 1000 g/kg (0 ... 7000 gr/lbs) |
| Accuracy (typical) | ±12% of reading |

# Technical data

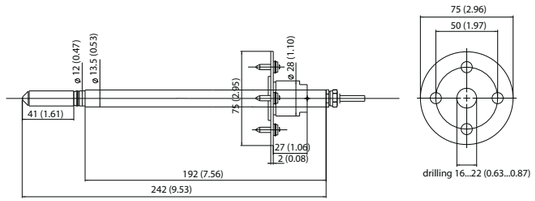
## Dimensions

Dimensions in mm (inches)

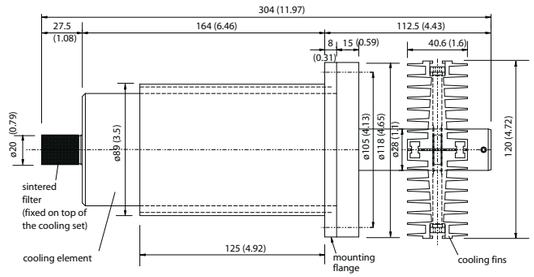
DMT345 and DMT346 Transmitter housing



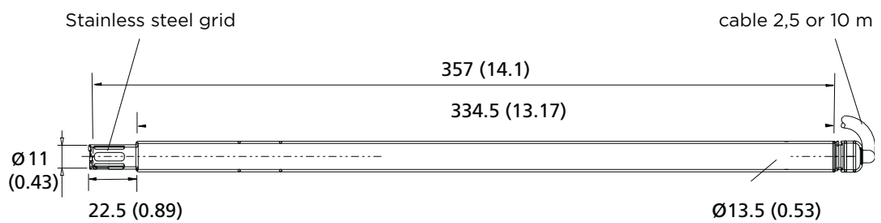

DMT345 probe and mounting flange




DMT346 Cooling set




DMT346 Probe

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# DMT242 Dewpoint Transmitter for OEM Applications

*Due to its wide measurement range and high long-term stability, the DMT242 is an ideal choice for low dewpoint industrial applications such as compressed air dryers, plastic dryers and other OEM applications.*

## Features/Benefits

- Ideal choice for industrial dryer applications
- Incorporates advanced Vaisala DRYCAP® Sensor and enhanced auto-calibration software
- Long-term stability in low dewpoints
- Fast response time
- Two sensor options cover dewpoint measurement range from -60 ... +60 °C (-76 ... +140 °F) with an accuracy of ±2 °C (±3.6 °F)
- Withstands condensation
- NIST traceable (certificate included)
- Compatible with Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70

## Vaisala DRYCAP®

The Vaisala DRYCAP® Dewpoint Transmitter DMT242 provides reliable and stable measurements for industrial dryer applications. It is designed for extreme conditions.

DMT242 incorporates the Vaisala DRYCAP® thin film polymer sensor and auto-calibration software. The standard sensor choice for dry gases and desiccant dryers is DRYCAP® 180M and for more humid applications such as refigeration dryers, a DRYCAP® 180S sensor.

Both the sensors are immune to particulate contamination, water condensation, oil vapor and most chemicals. Because the sensor withstands condensation, its performance is unmatched for low dewpoint applications that experience process water spikes, such as pipeline condensation during a system failure or start-up.

*The Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 is ideal for confirming the performance of the DMT242 in the field.*

The auto-calibration software works on-line while the process is running. If the measurement accuracy is not confirmed, corrections are made automatically. The DMT242 adjusts the measurement, corrects dry-end drifts and continues to function. Calibration occurs quickly, and with corrections so minor, it will go unnoticed.

## Compact, rugged and intelligent

Due to its compact size, DMT242 is quickly and easily installed in tight spaces.

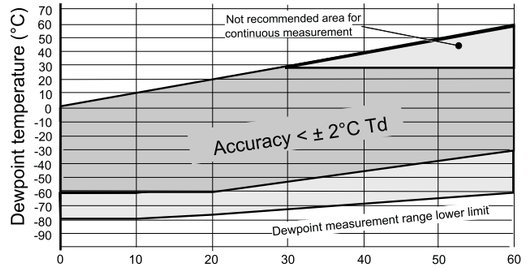
Users can perform a field-check by using the Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70. The transmitter can be sent to Vaisala Service for NIST traceable calibration. The recommended calibration interval is every two years.



# Technical data

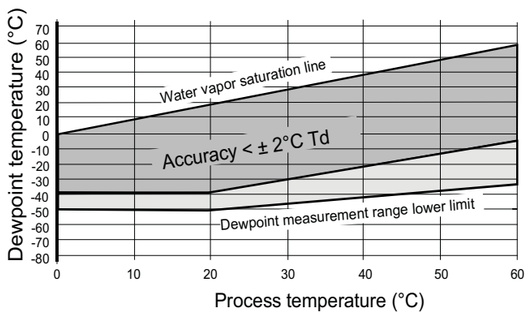
### Dewpoint temperature

| | |
|---|---|
| Measurement range (typical) | -60 ...+60 °C (-76 ...+140 °F) |
| Analog output scalings | |
| Option A | -80 ...+20 °C (-112 ...+68 °F) $T_d$ |
| Option B | -60 ...+60 °C (-76 ...+140 °F) $T_d$ |
| Option X | free scaling |
| (when the dewpoint is below 0 °C (32 °F), the transmitter outputs frostpoint) | |
| Accuracy with DRYCAP® 180M | ±2 °C (±3.6 °F) (see graph below) |




DEWPOINT ACCURACY VS. MEASUREMENT CONDITIONS

| | |
|---|---|
| Response time 63 % [90 %] at +20 °C gas temperature | |
| Flow rate >1 l/min and 1 bar pressure | |
| -60 -> -20 °C Td (-76 -> -4 °F Td) | 5 s [10 s] |
| -20 -> -60 °C Td (-4 -> -76 °F Td) | 45 s [10 min] |
| Accuracy with DRYCAP® 180S | ±2 °C (±3.6 °F) (see graph below) |




### Operating environment

| | |
|---|---|
| Temperature | 0 ...+60 °C (32 ...+140 °F) |
| higher temperature peaks | Short-term OK |
| Relative humidity | 0 ... 100 %RH |
| Pressure | 0 ... 20 bara (0 ... 290 psia) |
| Sample flow rate | no effect |

### Output

| | |
|---|---|
| Analog output | 4 ...20 mA |
| Resolution for analog output | ±0.002 mA |
| Typical temperature dependence | 0.0008 mA/ °C |
| Serial line for service use | RS232 |

### General

| | |
|---|---|
| Sensor | DRYCAP® 180M |
| Optimal sensor for refrigeration dryers | DRYCAP® 180S |
| Operating voltage | 18 - 35 VDC, 20 - 28 VAC |
| Power consumption at 24 VDC | max. 220 mA |
| External load for analog output | max. 500 Ω |
| Optional connection cable with DMT242 connector | 2 m or 10 m |
| Connector for supply voltage and signal output | |
| max. wire size | 0.75 $mm^2$ |
| max. cable diameter | 6.5 mm /PG7 |
| Service cable for serial interface RS232 | product code DMT242RS |
| Probe material (wetted parts) | stainless steel (AISI 316L) |
| Sensor protection | stainless steel sintered filter (HM47280) |
| Mechanical connection | G½" ISO228-1 thread with bonded seal ring (U-seal) |
| Eletronics housing material | plastic (ABS/PC) |
| Housing classification | IP65 (NEMA4) |
| Storage temperature range | -40 ...+70 °C, (-40 ...+158 °F) |

Complies with the EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial environment.

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# DMT152 Dewpoint Transmitter for Low Dew point Measurement in OEM Applications

*The small and powerful DMT152 measures dew point down to -80 °C.*

## Features/Benefits

- Compact
- Accurate
- Vaisala DRYCAP® technology with a polymer sensor
- Measures dew point down to -80 °C (-112 °F )
- Reduced maintenance costs due to long calibration interval
- Fast response time
- Withstands condensation
- NIST traceable
- Applications: compressed air, plastics drying, dry chambers, pure gases, and high-voltage circuit breakers

## DMT152

The Vaisala DRYCAP® Dewpoint Transmitter DMT152 is designed for measuring low dewpoint in OEM applications, even down to -80°C . The excellent long-term stability and reliability of its performance is based on the latest DRYCAP® polymer sensor technology.

## Low maintenance

The DMT152 mechanics have been designed for harsh environments requiring protection against dust, dirt, and splashed water.

The DRYCAP® technology has a low maintenance need due to its excellent long-term stability and durability against condensation.

## Applications

The DMT152 is an ideal choice for industrial applications where it is necessary to control very low humidity. Most typical areas of use are air and plastics dryers, dry chambers, pure gases, and highvoltage circuit breakers.

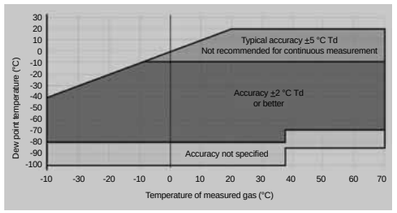
The DMT152 measures accurately and reliably also in the challenging combination of low humidity and hot air, which is typical in plastics drying.



# Technical data

## Measured variables

| | |
|---|---|
| DEW POINT TEMPERATURE | |
| Measurement range | -80 ...-10 °C (-112 ...+14 °F)$T_d$ |
| Accuracy | ±2 °C (3.6 °F) $T_d$ |
| Non-calibrated range | -100 ...+20 °C (-148 ...+68 °F)$T_d$ |
| Analog output scalings | |
| option 1 | -80 ...+20 °C (-112 ...+68 °F) $T_d$ |
| option 2 | -100 ...0 °C (-148 ...+32 °F) $T_d$ |
| option 3 | user-specified output scaling |
| when dew point is below 0 °C (32 °F) the transmitter outputs frost point | |
| Accuracy over temperature range | |


Typical accuracy ±5 °C Td
Not recommended for continuous measurement
Accuracy ±2 °C Td
or better
Accuracy not specified
Dew point temperature (°C)
Temperature of measured gas (°C)

| | |
|---|---|
| Response time 63 % [90 %] at a gas temperature of +20 °C (+68 °F) and pressure of 1 bar | |
| -10 ...-80 °CTd | 0.5 min [7.5 min] |
| -80 ...-10 °CTd | 2 s [5 s] |
| PPM VOLUME CONCENTRATION | |
| Measurement range (typical) | 0 ...500 ppm |
| Accuracy at +20 °C (+68 °F), 1013 mbar | ±(0.2 ppm + 20 % of reading) |

## Operating environment

| | |
|---|---|
| Temperature | -40 ...+70 °C (-40 ...+158 °F) |
| Relative humidity | 0 ... 100 %RH (up to + 20 °C/68 °F) |
| Pressure | 0 ...50 bar (725 psia) |
| Measured gases | non-corrosive gases |
| Sample flow rate | no effect on measurement accuracy |

## Outputs

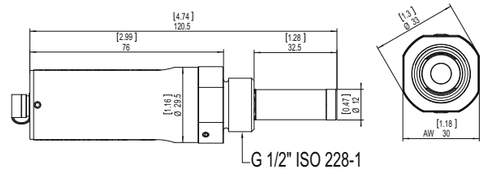
| | |
|---|---|
| Two analog outputs (scalable) | 4 ...20 mA, 0 ...20 mA (3 wire)<br>0 ...5 V, 0 ... 10 V |
| Accuracy of analog outputs | ± 0.01 V / ±0.01 mA |
| Digital output | RS485 (2-wire) |
| Alarm-level indication by analog signal | user selectable |
| Purge information | 5 V, 10 V, 20 mA or LED |

## General

| | |
|---|---|
| Sensor | Vaisala DRYCAP® 180U |
| | Thin-film capacitive polymer sensor |
| Recommended calibration interval | 2 years |
| Operating voltage with | |
| RS485 output | 11* ...28 VDC |
| voltage output | 15* ...28 VDC |
| current output | 21 ...28 VDC |
| *For extended temp. down to -40 °C (-40 °F) or pressure up to 50 bar (725 psia), the supply voltage is 21 ...28 VDC. | |
| Supply current | |
| normal measurement | 20 mA + load current |
| during self-diagnostics | max. 220 mA pulsed |
| Supply voltage fluctuation | max. 0.3 V |
| External load for | |
| voltage output | min. 10 kOhm |
| current output | max. 500 Ohm |
| Housing material (wetted parts) | AISI316L |
| Stainless steel mesh filter | AISI303, filter grade 18 µm |
| Mechanical connections | ISO G½", NPT ½", UNF 3/4"- 16" |
| Housing classification | IP65 (NEMA 4) |
| Storage temperature range | -40 ...+80 °C (-40 ...+176 °F) |
| Weight (ISO G½") | 190 g (6.70 oz) |
| Complies with EMC standard EN61326-1, Electrical equipment for measurement control and laboratory use - EMC requirements; Industrial environment | |

## Accessories

| | |
|---|---|
| Connection cable for MI70 hand-held indicator | 219980 |
| USB cable for pc connection | 219690 |
| Sampling cells (available for ISO G½") | |
| basic sampling cell | DMT242SC |
| with Swagelok 1/4" male connectors | DMT242SC2 |
| with a quick connector and leak screw | DSC74 |
| two-pressure sampling cell | DSC74B |
| NW40 flange | 225220SP |

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# DMT142 Miniature Dewpoint Transmitter for OEM Applications

*The Vaisala DRYCAP® Dewpoint Transmitter DMT142 is an ideal choice for small compressed air dryers, plastic dryers and other OEM applications.*

*The Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 is ideal for confirming the performance of the DMT142 in the field.*

## Features/Benefits

- Miniature size dew point transmitter for e.g. small industrial dryer applications
- Vaisala DRYCAP® technology with auto-calibration
- Calibration interval of two years
- Dew point measurement range -60 ... +60 °C (-76 ... +140 °F) with an accuracy ±3 °C (±5.4°F)
- Withstands condensation
- Fast response time
- Compatible with Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70
- NIST traceable (certificate included)

## Vaisala DRYCAP®

The Vaisala DRYCAP® Dewpoint Transmitter DMT142 is a miniature dew point measurement instrument. The transmitter can be installed directly into pressurized systems at 50 bar (725 psia) maximum pressure. The long-term high performance is achieved with Vaisala DRYCAP® technology.

The sensor fully withstands getting wet, and therefore, the transmitter performs exceptionally well in applications that occasionally experience process water spikes, such as pipeline condensation during a system failure or start-up. The sensor is also immune to particulate contamination, oil vapor and most chemicals, and is insensitive to the flow rate.

## Long calibration interval

The calibration interval of the DMT142 is two years. Additionally, the Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 can be used to confirm the performance of the DMT142 without disconnecting the transmitter. For any adjustment needs, the transmitter can be sent to Vaisala Service.

The auto-calibration software works on-line while the process is running. If the measurement accuracy is not confirmed, corrections are made automatically.

## Easy installation

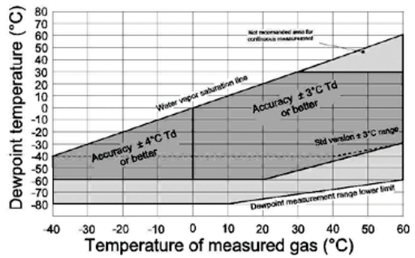
The DMT142 has a variety of features to choose from, including different output and installation options. Due to its small size and light weight, the DMT142 is quickly and easily installed in tight spaces or in small-size pipelines.



# Technical data

## Measured variables

| | |
|---|---|
| DEW POINT TEMPERATURE | |
| Measurement range(typical) | |
| Standard version | -40 ...+60 °C (-40 ...+140 °F) $T_d$ |
| Extended version | -60 ...+60 °C (-76 ...+140 °F) $T_d$ |
| $SF_6$ version | -50 ...+60 °C (-58 ...+140 °F) $T_d$ |
| Analog output scalings | |
| option 1 | -80 ...+20 °C (-112 ...+68 °F) $T_d$ |
| option 2 | -60 ...+40 °C (-76 ...+104 °F) $T_d$ |
| option 3 | free scaling |
| Accuracy | ±3 °C (±5.4 F) $T_d$ (see graph below) |
| (when the dew point is below 0 °C (32 °F), the transmitter outputs frostpoint) | |


Dewpoint temperature (°C)
Temperature of measured gas (°C)
Not recommended area for continuous measurement
Water vapor saturation line
Accuracy ±3°C Td or better
Accuracy ±4°C Td or better
Std version ±3°C range
Dewpoint measurement range lower limit

Dewpoint accuracy range for the extended version. Standard version with dotted line.

| | |
|---|---|
| DEW POINT ACCURACY VS. MEASUREMENT CONDITIONS | |
| Dew point accuracy range for the extended version. Standard version with dotted line. | |
| Response time 63% [90%] at +20 °C gas temperature and 1 bar pressure | |
| -60 -> -20 °C $T_d$ (-76 -> -4 °F $T_d$) | 5 s [10 s] |
| -20 -> -60 °C $T_d$ (-4 -> -76 °F $T_d$) | 45 s [10 min] |
| PPM VOLUME CONCENTRATION | |
| Measurement range | 70 ... 200 000 ppm |
| Accuracy at +20 °C (+68 °F), 1013 mbar | 7.3 ppm + 9.2% of reading |

## Operating environment

| | |
|---|---|
| Temperature *) | -40 ...+60 °C (-40 ...+140 °F) |
| Relative humidity | 0 ... 100 %RH |
| Pressure *) | 0 ... 50 $bar_a$ (725 psia) |
| Sample flow rate | no effect for measurement accuracy |

*) For extended temperature down to -40 °C (-40 °F) or pressure up to 50 $bar_a$ (725 psia) the supply voltage must be 24 ... 28 VDC.

## Outputs

| | |
|---|---|
| Analog output (scalable) | 4 ... 20 mA (3-wire), 0 ... 1 V/5 V |
| Resolution for current output | 0.002 mA |
| Resolution for voltage output | 0.3 mV |
| Typical temperature dependence | 0.005% of span / °C |
| Connector | 4-pin M8 (IEC 60947-5-2) |
| connection cable with snap-on or thread locking available | |
| RS232 serial line for service use | with DMT142RS cable |

## General

| | |
|---|---|
| Sensor | Vaisala DRYCAP® 180D |
| Measured gases | non-corrosive gases ($SF_6$ gas with special model) |
| Recommended calibration interval to confirm the specified accuracy | 2 years |
| Operating voltage with voltage output | 12 ... 28 VDC |
| Operating voltage with current output | 18 ... 28 VDC |
| Supply current | |
| normal measurement | 10 mA + load current |
| during self-diagnostics | max. 220 mA pulsed |
| Load for current output | max. 500 ohm |
| Load for voltage output | min. 10 kohm |
| Housing material | stainless steel body (AISI316L) plastic cap(ABS/PC) |
| Sensor protection | stainless steel sintered filter |
| Mechanical connection | G1/2" ISO 228-1 thread with bonded seal ring (U-seal) |
| Housing classification | IP64 (NEMA 3S) |
| Storage temperature range | -40 ...+80 °C (-40 ...+176 °F) |
| Weight | 118 g (4.16 oz) |

Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial environment.

## Accessories

| | |
|---|---|
| Output cable M8, snap-on connector, 2 meters | 211598 |
| Output cable M8, thread connector, 3 meters | HMP50Z300, several lengths available |
| Connection cable for DM70 | 211917ZZ |
| Service cable for serial line | DMT142RS |
| Sampling cells | |
| basic sampling cell | DMT242SC |
| with Swagelok 1/4" male connectors | DMT242SC2 |
| with quick connector and leak screw | DSC74 |
| two-pressure sampling cell | DSC74B |
| cooling/venting coil | DMCOIL |

See DM70 / Portable Sampling Systems and Sampling Cells for further information about sampling cells available

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# DM70 Hand-Held Dewpoint Meter for Spot-Checking Applications

*The Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 offers accurate and fast measurement for industrial dew point applications, such as compressed air, metal treatment and plastics drying.*

## Features/Benefits

- Designed for industrial spot-checking and field calibration
- Three models: accurate measurement ranges from -60 to +60 °C (-76 ... +140 °F)
- Vaisala DRYCAP® Sensor with patented autocalibration function
- Low maintenance need due to superior long-term stability
- Sensor withstands condensation
- Fast response, enhanced by Sensor Purge option
- Easy-to-use user interface
- Data can be logged and transferred to a PC via MI70 Link software
- Compact, small and light
- NIST traceable (certificate included)

The Vaisala DRYCAP® Hand-Held Dewpoint Meter DM70 measures dew point temperature accurately over a wide measurement range. The probe may be inserted directly into pressurized processes, and it responds rapidly from ambient to process conditions. The sensor withstands condensation and fully recovers from getting wet.

Three probe models, all with auto-calibration, are available. The A and B models are both general purpose probes. The C model is specifically developed for $SF_6$ gas. The B and C probe models have an additional Sensor Purge feature that heats and dries the sensor, making the response from ambient to dry conditions exceptionally fast.

The DM70 is fitted with the Vaisala DRYCAP® Sensor. The sensor provides reliable, stable and high-performance dew point measurement. Autocalibration detects on-line possible measurement inaccuracies and automatically corrects dry-end drift in the calibration curve.

The DM70 has a versatile and easy-to-use, menu-based user interface, a clear graphical LCD display, and data-logging capability. It can also be used as a tool for reading the output of fixed Vaisala dew point transmitters, like the DMT242, DMT142, DMT152 and DMT340.

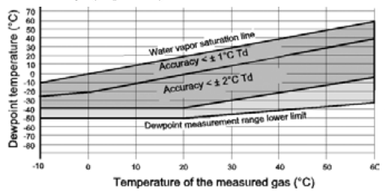
The DM70 displays one to three parameters at a time, either numerically or graphically. Several humidity units can be selected. In addition, the DM70 includes conversion from gas pressure dew point to ambient pressure dew point. An analog output is also available.

The DM70 meter is suitable for direct process dew point measurement in a wide temperature and pressure range. For more demanding applications, the DM70 can be used with the Vaisala sampling cell adapters, or with the Vaisala DRYCAP® Sampling System DSS70A.

# Technical data

### Measured variables, DMP74A probe

| DEW POINT | |
|---|---|
| Measurement range (typical) | -50 ...+60 °C (-58 ...+140 °F) |
| Accuracy (A probe) -40...+60 °C | ±2 °C (±3.6 °F) |
| | (see graph) |


Dewpoint temperature (°C)
Water vapor saturation line
Accuracy < ± 1°C Td
Accuracy < ± 2°C Td
Dewpoint measurement range lower limit
Temperature of the measured gas (°C)

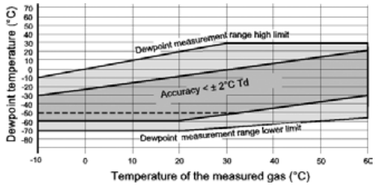
*Dew point accuracy vs. measurement conditions*

| | |
|---|---|
| Response time | |
| flow rate 0.2 m/s, 1 bar pressure, +20 °C (+68 °F) | 63% [90%] |
| 0 -> -40 °C Td (32 -> -40 °F Td) | 20 s [120 s] |
| -40 -> 0 °C Td (-40 -> 32 °F Td) | 10 s [20 s] |
| Dew point sensor | Vaisala DRYCAP® 180S |

# Technical data

### Measured variables, DMP74B and DMP74C (for SF6 gas) probes

| DEW POINT | |
|---|---|
| Measurement range (typical) | -70 ...+30 °C (-94 ...+86 °F) |
| Accuracy (B and C probe) -60...+20 °C | ±2 °C (±3.6 °F) |
| | (see graph) |


Dewpoint temperature (°C)
Dewpoint measurement range high limit
Accuracy < ± 2°C Td
Dewpoint measurement range lower limit
Temperature of the measured gas (°C)

*Dew point accuracy vs. measurement conditions*

Dotted line:
For DMP74C the ±2 °C accuracy range is limited to -50 °C $T_d$ when used in SF6 gas.

| | |
|---|---|
| Response time | |
| flow rate 0.2 m/s, 1 bar pressure, +20 °C (+68 °F) | 63% [90%] |
| 0 -> -60 °C Td (32 -> -76 °F Td) | 50 s [340 s] |
| -60 -> 0 °C Td (-76 -> 32 °F Td) | 10 s [20 s] |
| Dew point sensor | Vaisala DRYCAP® 180M |
| TEMPERATURE | |
| Measurement range | -10 ...+60 °C (+14 ...+140 °F) |
| Accuracy at +20 °C (+68 °F) | ±0.2 °C (±0.36 °F) |
| Typical temperature dependence of electronics | ±0.005 °C/°C (±0.005 °F/°F) |
| Temperature sensor | Pt100 IEC751 1/3 class B |
| OTHER VARIABLES AVAILABLE | |
| Dew point converted to atmospheric pressure, ppm volume and ppm weight concentration | |

### All probe models

| | |
|---|---|
| Operating temperature | -10 ...+60 °C (+14 ...+140 °F) |
| Operating pressure | |
| DMP74A, DMP74B | 0 ...20 bara (0 ...290 psia) |
| DMP74C | 0 ...10 bara (0 ...150 psia) |
| Sample flow rate | no effect for measurement accuracy |
| Measured gases | non-corrosive gases |
| Probe material (wetted parts) | Stainless steel (AISI 316L) |
| Sensor protection | Sintered filter (AISI 316L) partno: HM47280 |
| Mechanical connection | G1/2" ISO228-1 thread with bonded seal ring (U-seal) |
| Housing classification | IP65 (NEMA 4) |
| Weight | 350 g |

### MI70 indicator, general

| | |
|---|---|
| Menu languages | English, Chinese, Spanish, Russian, French, Japanese, German, Swedish, Finnish, |
| Display | LCD with backlight<br>Graphic trend display of any parameter<br>Character height up to 16 mm |
| Max. no of probes | 2 |
| Power supply | Rechargeable NiMH battery pack with AC-adapter or 4xAA size alkalines, type IEC LR6 |
| Analog output | 0...1 VDC |
| Output resolution | 0.6 mV |
| PC interface | MI70 Link software with USB or serial port cable |
| Datalogging capacity | 2700 points |
| Alarm | Audible alarm function |
| Operating temperature range | -10...+40 °C (+14…+104 °F) |
| Storage temperature range | -40 ...+70 °C (-40 ...+158 °F) |
| Operating humidity range | 0 ... 100 % RH, non-condensing |
| Housing classification | IP54 |
| Housing materials | ABS/PC blend |
| Weight | 400 g |
| Battery operation time with DMP74 probe | |
| continuous use | 48 h typical at +20 °C (+68 °F) |
| data logging use | up to a month, depending on logging interval |
| Electromagnetic compatibility | EN 61326-1, Generic Environment |

### Accessories

| | |
|---|---|
| Connection cables for fixed Vaisala dew point transmitters | |
| for DMT242 transmitter | 27160ZZ |
| for DMT340 series | 211339 |
| for DMT152 transmitter | 219980 |
| for DMT142 transmitter | 211917ZZ |
| MI70 Link software with USB cable | 219687 |
| MI70 Link software with serial port cable | MI70LINK |
| Analog output cable | 27168ZZ |
| 10 m (32.81 ft) extension cable for probe | 213107SP |

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# DSS70A Portable Sampling System and Sampling Cells for DM70

*The DSS70A provides a compact solution for field checking dew point where direct measurement is difficult. Typical applications for the sampling system are metal treatment and plastics drying processes.*

## DSS70A portable sampling system

The DSS70A is designed to provide dewpoint sampling flexibility: for the DM70 hand-held dew point meter. For processes at atmospheric pressure, a battery powered pump is used to extract a gas sample. For pressurized processes up to 20 bar, the sample is measured at process pressure and then reduced to atmospheric pressure for venting or re-direction, bypassing the pump. In all cases, the sample gas passes through a filter to remove particulate contamination before measurement. Flow through the system is controlled and monitored with a needle valve and flow meter.

The DSS70A is easily connected to an appropriate sample point with tubing (typically 1/4" or 6 mm). The measured dewpoint must be below ambient temperature to avoid condensation in the system. Gas temperatures higher than +40 °C (+104 °F) should be cooled with a short PTFE (included in the DSS70A system) or stainless steel tube prior to entering the DSS70A.

## Sampling cells for pressurized processes

The DM70 can easily be connected to pressurized processes. In addition to direct pipeline installation, a variety of sampling cell options are available for gas sampling.

The DSC74 sampling cell is the recommended choice. It has a variety of connection adapters that allow several different ways of installation. The quick connector with a leak screw allows a very fast connection for compressed air lines. Additionally, two thread adapters are available for the inlet port.

The DSC74B is a two-pressure sampling cell, which enables measurements in both process and ambient pressure. This sampling cell is especially suitable for dewpoint measurements in $SF_6$ gas with the DMP74C probe.

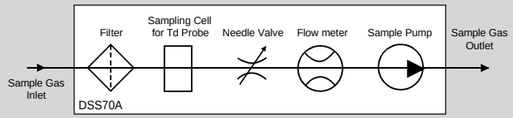
The DMT242SC is a basic sampling cell. The DMT242SC2 is a sampling cell supplied with welded Swagelok connectors for sampling in a 1/4" pipeline.

*The sampling cells (from the left) DMT242SC2, DMT242SC and DSC74 can be used to connect the DM70 to sample gas flow. The DSC74B (right) is a two-pressure sampling cell that can be used for measurements in either pressurized or ambient pressure. The cooling/venting coil is included in the DSC74C sample cell, but is an option for all sampling cells.*

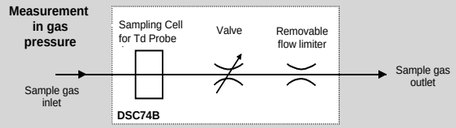


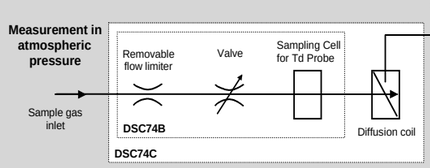
# Technical data

### DSS70A Sampling System and DSC74B/C Sampling Cells




The DSS70A sampling system includes a filter to clean the dirty sample gas and a needle valve to control the sample flow rate with the flow meter. A sample pump is used to generate a sample flow from processes at ambient pressure.




The DSC74B sampling cell enables the measurement of the sampled gas either in gas pressure up to 10 bar or in atmospheric pressure depending on the gas inlet and outlet. The DSC74C is like the DSC74B but with an additional coil to avoid back diffusion, the effect of surrounding moisture, in dewpoint measurements in atmospheric pressure.

### Sampling cells technical data

| | |
|---|---|
| DSC74 | sampling cell for pressurized gases |
| pressure limit | 1 MPa (10 barg, 145 psig) |
| DSC74B | two pressure sampling cell |
| pressure limit | 1 MPa (10 barg, 145 psig) |
| DSC74C | DSC74B with DMCOIL cooling/ venting coil |
| DMCOIL | cooling/venting coil |
| DMT242SC | sampling cell |
| pressure limit | 10 MPa (100 barg, 1450 psig) |
| DMT242SC2 | sampling cell with Swagelok connectors |
| pressure limit | 4 MPa (40 barg, 580 psig) |
| Material for all sampling cells | stainless steel AISI316 |

### DSS70A sampling system Operating conditions

| | |
|---|---|
| Operating gases | air, N2 and other non-toxic, inert gases |
| Dewpoint range | -70 °C ...Tamb (-76 °F ...Tamb) |
| Inlet/outlet connection | 1/4" Swagelok |
| Operating temperature | |
| ambient temperature | 0 ...+40 °C (32 ...+104 °F) |
| process gas temperature | |
| with PTFE tube at +20 °C (+68 °F) | max. +200 °C (+392 °F) |
| with stainless steel tube (included in the DSS70A) | specification according to stainless steel tube specification |
| maximum gas temperature at inlet | +40 °C (+104 °F) |
| Operating pressure | |
| with pump | 0.6 ... 1.2 bara (8.7 ... 17.4 psia) |
| pump disconnected | 0 ... 20 bara (0 ... 290 psia) |

### General

| | |
|---|---|
| Battery operation time for pump | 8 h continuous use |
| | battery can be recharged using DM70 charger |
| Filter | 7 mm inline filter cartridge 1/4" Swagelok SS-4F-7 (spare part order no. 210801) |
| Materials | |
| wetted parts | Stainless steel |
| carrying case | ABS plastic |
| Case size (W x D x H) | 430 x 330 x 100 mm |
| Weight | 5.5 kg (12 lbs) |

### Electromagnetic compatibility

EN61326-1, Generic Environment.

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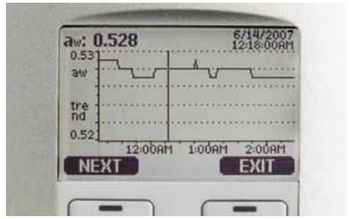
# MMT330 Moisture and Temperature Transmitter Series for Oil

*The MMT330 transmitter family offers a range of solutions for demanding moisture in oil measurements.*




*The display shows measurement trends, real time data and history.*

## Features/Benefits

- Continuous on-line measurement of moisture in oil
- Ball valve installation – no need to shut down the process
- Incorporates Vaisala HUMICAP® Sensor – more than 30 years of field performance
- Ten years of experience in measuring moisture in oil
- Excellent long-term stability
- Easy to calibrate and maintain in the field - Compatible with Vaisala HUMICAP® Hand-Held Moisture for Oil Meter MM70
- NIST traceable calibration (certificate included)
- Analog outputs, WLAN/LAN

The Vaisala HUMICAP® Moisture and Temperature Transmitter Series for Oil MMT330 enables fast and reliable detection of moisture in oil. The MMT330 can be used in on-line moisture monitoring and as a control device, allowing separators and oil driers to be started only when needed.

Proper monitoring saves both oil and the environment. With the MMT330 it is easy and economical to monitor the changes of moisture in oil.

## Reliable Vaisala HUMICAP® technology

The MMT330 incorporates the latest generation of the Vaisala HUMICAP® Sensor, which is the result of ten years of field experience. It was developed for demanding moisture measurement in liquid hydrocarbons.

The sensor's excellent chemical tolerance provides accurate and reliable measurement over a wide measurement range.

## For diverse applications and demanding conditions

Because of the variety of probes, the transmitter can be used in lubrication systems, hydraulic systems, and transformers.

## Indicates the margin to water saturation

The MMT330 measures moisture in oil in terms of the water activity (aw) and temperature (T). Water activity indicates directly whether there is a risk of free water formation. The measurement is also independent of oil type and age.

## Water content as ppm conversion

In addition to water activity, the MMT330 can output ppm, the average mass concentration of water in oil. Vaisala has this conversion readily availabe for mineral transformer oil.

For other oils, the oil specific conversion coefficients can be programmed to the transmitter if the water solubility of the oil is known.

## Graphical measurement trend and historical display

The MMT330 can be ordered with a large numerical and graphical display with a multilingual menu. It allows the user to monitor operational data, measurement trends and up to 1-year measurement history. The optional data logger with real-time clock makes it possible to generate over four years of measured history, and zoom in on any desired time or time frame.

The display alarm allows tracking of any measured parameter, with a freely configurable low and high limit.

## Data collection and (wireless) transfer to PC

The recorded measurement data can be viewed on the display or transferred to a PC with Microsoft Windows® software. The transmitter can also be connected to a network with an optional (W)LAN interface, which enables a (wireless) Ethernet connection.

## Versatile outputs and easy installation

The MMT330 provides up to three analog outputs. Galvanic isolation of supply power and analog outputs is also available. For serial interface the USB connection, RS232 and RS485 can be used. In addition, alarm relay option is available.

The MMT330 has several options for transmitter mounting. Transmitters are delivered pre-configured with all settings installation ready.

*The Vaisala HUMICAP® Hand-Held Moisture for Oil Meter MM70 is designed for field checking MMT330 transmitters.*

*The MMT332 probe is installed using a flange. It is for high pressure applications.*

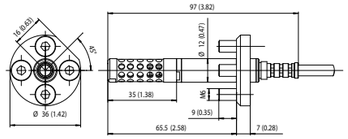
## Installation options

**MMT332 For High Pressure Installations**

| | |
|---|---|
| Pressure range | 0 ... 250 bar / 0 ... 3625 psia |
| Probe diameter | 12 mm / 0.5 inch |
| Installation | |
| Flange | 36 mm / 1.4 inch |
| Temperature | |
| Measurement range | -40 ... +180 °C (-40 ... 356 °F) |

## Dimensions

Dimensions in mm (inches)



*The MMT337 probe, with optional Swagelok connector, is ideal for tight spaces with a thread connection. The small probe is designed for integrating into confined spaces with small diameter lines.*

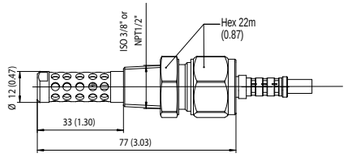
## Installation options

**MMT337 with Small Sized Probe**

| | |
|---|---|
| Pressure range | 0 ... 10 bar / 0 ... 145 psia |
| Probe diameter | 12 mm / 0.5 inch |
| Installation | |
| Fitting Body | R 3/8" ISO |
| Fitting Body | 1/2" ISO |
| Fitting Body | NPT 1/2" |
| Temperature | |
| Measurement range | -40 ... +180 °C (-40 ... 356 °F) |

## Dimensions

Dimensions in mm (inches)



*The MMT338 is ideal for installations in pressurized processes where the probe needs to be removed while the process is running. The probe depth is adjustable.*

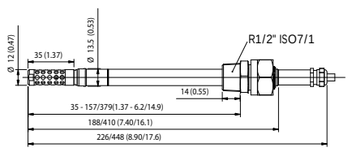
## Installation options

**MMT338 with Probe for Pipeline Installations**

| | |
|---|---|
| Pressure range with ball valve | 0 ... 40 bar / 0 ... 580 psia<br>up to 120 °C (248 °F) and 40 bar |
| Adjustable length | 35 ... 157/379 mm / 1.37 ... 6.2 /14.9 inch |
| Installation | |
| Fitting Body | R1/2" ISO |
| Fitting Body | NPT 1/2" |
| Ball Valve Set | BALLVALVE-1 |
| Sampling Cell | DMT242SC2 |
| Temperature | |
| Measurement range | -40 ... +180 °C (-40 ... 356 °F) |

## Dimensions

Dimensions in mm (inches)






# Technical data

## Measured values

| | |
|---|---|
| WATER ACTIVITY | |
| Measurement range $a_w$ | 0 ... 1 |
| Accuracy (including nonlinearity, hysteresis and repeatability) | |
| 0 ... 0.9 | ±0.02 |
| 0.9 ... 1.0 | ±0.03 |
| Response time (90 %) at +20 °C in still oil (with stainless steel filter) | 10 min. |
| Sensor | HUMICAP® |

## Performance

| | |
|---|---|
| TEMPERATURE | |
| Measurement range | |
| MMT332 | -40 ... +180 °C (-40 ... +356 °F) |
| MMT337 | -40 ... +180 °C (-40 ... +356 °F) |
| MMT338 | -40 ... +180 °C (-40 ... +356 °F) |
| Accuracy at +20 °C (+68 °F) | ± 0.2 °C (0.36 °F) |

## Operating environment

| | |
|---|---|
| Operating temperature | |
| for probes | same as measurement ranges |
| for transmitter body | -40 ... +60 °C (-40 ... +140 °F) |
| with display | 0 ... +60 °C (+32 ... +140 °F) |
| Pressure range for probes | See probe specifications |

Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial environment.

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 10 ... 35 VDC, 24 VAC |
| with optional power supply module | 100 ... 240 VAC 50/60 Hz |
| Power consumption @ 20 °C ($U_{in}$ 24VDC) | |
| RS-232 | max 25 mA |
| $U_{out}$ 2 x 0...1V / 0...5V / 0...10V | max 25 mA |
| $I_{out}$ 2 x 0...20 mA | max 60 mA |
| display and backlight | + 20 mA |
| Analog outputs (2 standard, 3rd optional) | |
| current output | 0 ... 20 mA, 4 ... 20 mA |
| voltage output | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V |
| Accuracy of analog outputs at 20 °C | ± 0.05 % full scale |
| Temperature dependence of the analog outputs | ± 0.005 %/°C full scale |
| External loads | |
| current ouputs | $R_L$ < 500 ohm |
| 0 ... 1V output | $R_L$ > 2 kohm |
| 0 ... 5V and 0 ... 10V outputs | $R_L$ > 10 kohm |

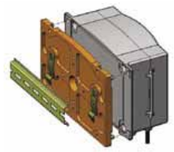
| | |
|---|---|
| Max wire size | 0.5 mm² (AWG 20) stranded wires recommended |
| Digital outputs | RS-232, RS-485 (optional) |
| Service connection | RS-232, USB |
| Relay outputs | 0.5 A, 250 VAC, SPDT, Potential Free (optional) |
| Ethernet interface (optional) | |
| Supported standards | 10/100Base-T |
| Connector | RJ45 |
| Protocols | Telnet |
| WLAN interface (optional) | |
| Supported standards | 802.11b |
| Antenna connector type | RP-SMA |
| Protocols | Telnet |
| Security | WEP 64/128, WPA |
| Authentication / Encryption | |
| Open / no encryption | |
| Open / WEP | |
| WPA Pre shared key / TKIP | |
| WPA Pre shared key / CCMP (a.k.a. WPA2) | |
| Optional data logger with real-time clock | |
| Logged parameters | max. three with trend/min/max values |
| Logging interval | 10 sec (fixed) |
| Max. logging period | 4 years 5 months |
| Logged points | 13,7 million points per parameter |
| Battery lifetime | min. 5 years |
| Display | LCD with backlight, graphic trend display of any parameter |
| Display menu languages | English, Chinese, Spanish, German, French, Japanese, Russian, Swedish, Finnish |

## Mechanics

| | |
|---|---|
| Cable bushing | M20x1.5 for cable diameter 8 ... 11mm/0.31 ... 0.43" |
| Conduit fitting | 1/2"NPT |
| Interface cable connector (optional) | M12 series 8 pin (male) |
| option 1 | with plug (female) with 5 m / 16.4 ft black cable |
| option 2 | with plug (female) with screw terminals |
| USB-RJ45 Serial Connection Cable (incl. Mi70 Link software) | 219685 |
| Probe cable diameter | 5.5 mm |
| Probe cable lengths | 2 m, 5 m or 10 m |
| Housing material | G-AlSi 10 Mg (DIN 1725) |
| Housing classification | IP 65 (NEMA 4X) |

## Mounting options

Mounting with Wall Mounting Kit



Mounting with DIN Rail Installation Kit

Pole Installation with Installation Kit for Pole or Pipeline

Mounting Rain Shield with Installation Kit

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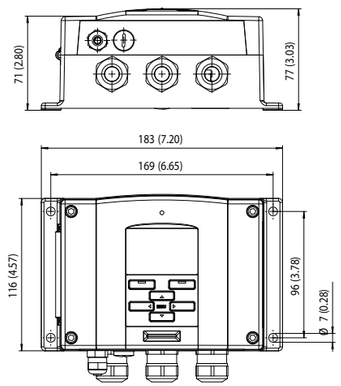
## Dimensions

Dimensions in mm (inches)




TYPE APPROVED PRODUCT
CERTIFICATE NO.: A-11440

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**New intelligence for measuring moisture in oil.**

- On-line, real time measurement without sampling
- Installation through ball valve – no need to shut down the process
- High stability in extreme conditions

**Know your oil better – Vaisala HUMICAP® instruments!**

**Download the 'Top 8 FAQs - Measuring moisture in oil' at www.vaisala.com/mioFAQ**

*Instruments display water activity trends.*

www.vaisala.com/mioFAQ sales@vaisala.com VAISALA

# MMT310 Series Moisture and Temperature Transmitter for Oil

*Two probe options: MMT317 and MMT318*

## Features/Benefits

- Continuous measurement of moisture in oil
- Proven Vaisala HUMICAP® sensor, 10 years in oil applications
- Measurements in lubrication, hydraulic and transformer oils
- Excellent pressure and temperature tolerance
- Measuring water activity - ppm calculation for transformer oil
- Small size, easy to integrate
- NIST traceable calibration
- Applications: e.g. monitoring of transformer oil and of lubrication systems in marine and paper industry

The Vaisala HUMICAP® Moisture and Temperature Transmitter Series for Oil MMT310 is a fast and reliable on-line detector for moisture in oil.

## Reliable Vaisala HUMICAP® technology

The MMT310 series incorporates the latest generation of the Vaisala HUMICAP® Sensor, developed for demanding moisture measurement in liquid hydrocarbons. The sensor's excellent chemical tolerance provides accurate and reliable measurement over the wide measurement range.

## Measuring water activity

The MMT310 series measures moisture in oil in terms of the water activity (aw) and temperature (T).

Water activity directly indicates if there is a risk of free water formation. The measurement is independent of oil type, age, and temperature.

## Water content as ppm calculation for transformer oils

PPM units are traditionally used in transformer applications. They indicate the average mass concentration of water in oil. The ppm calculation for mineral oil based transformer oil is optional in the MMT310 series.

## Diverse applications and demanding conditions

The MMT310 series can be used in lubrication and hydraulic systems as well as in transformers. It can be used for on-line moisture monitoring and as a control function, allowing separators and oil purifiers to be started only when necessary.

## Installation options

The MMT318 has two adjustable probe lengths. The transmitter can be ordered with a ball valve set that enables the insertion and removal of the moisture probe for calibration, without the need to empty the oil system.

The MMT317 has a small pressure-tight probe with optional Swagelok fittings.

## Several outputs, one connector

The MMT310 series has two analog outputs and an RS-232 serial output. The output signals and the supply power travel in the same cable, the only cable connected to the unit.



# Technical data

## Measured values

| | |
|---|---|
| WATER ACTIVITY | |
| Measurement range $a_w$ | 0 ... 1 |
| Accuracy (including non-linearity, hysteresis and repeatability) | |
| 0 ... 0.9 | ±0.02 |
| 0.9 ... 1.0 | ±0.03 |
| Response time (90 %) at +20 °C in still oil (with stainless steel filter) | 10 min |
| Sensor | Vaisala HUMICAP® |
| TEMPERATURE | |
| Measurement range | -40 ... +180 °C (-40 ... +356 °F) |
| Typical accuracy at +20 °C | ±0.1 °C (±0.18 °F) |
| Typical temperature dependence of electronics | ±0.05°C/ °C (±0.005 °F/°F) |
| Sensor | Pt100 IEC751/3 class B |

## Electrical connections

| | |
|---|---|
| Two analog outputs, selectable and scalable | 0 ... 20 mA or 4 ... 20 mA |
| Typical accuracy of analog output at +20 °C | ±0.05 % full scale |
| Typical temperature dependence of analog output | 0.005 %/°C (0.003 %/°F) full scale |
| Serial output | RS-232C |
| Connections | 8-pole connector with RS-232C, current outputs (two channels) and $U_{in}$ |
| Operating voltage $U_{in}$ | 24 VDC (10 ... 35 VDC) |
| Minimum operating voltage $U_{in}$ | |
| with RS-232C | 10 VDC |
| $I_{out}$ 0 ... 20 mA, 4 ... 20 mA | 11 VDC + ($R_{load}$/60) VDC |
| Power consumption at +20 °C, $U_{in}$ = 24 VDC | |
| with RS-232C | 20 mA |
| $I_{out}$ 2 x 0 ... 20 mA | 60 mA |

## General

| | |
|---|---|
| Operating temperature range for electronics | -40 ... +60 °C (-40 ... +140 °F) |
| Storage temperature | -55 ... +80 °C (-67 ... +176 °F) |
| Pressure range for MMT318 with ball valve up to 120 °C | 0 ... 40 bar |
| Pressure range for MMT317 | 0 ... 10 bar |
| External load | $R_l$<500 Ohm |
| Material | |
| transmitter housing | G-AlSi 10 Mg |
| transmitter base | ABS/PC |
| Housing classification | IP65 to be protected from direct rain |
| Cable feed through alternatives | 8-pole connector with 5 m cable, female 8-pin connector screw joint for cable diameter 4 ... 8 mm |
| Sensor protection | stainless steel grid |
| Probe cable length | |
| MMT317 | 0.5, 2, 5 or 10 meters |
| MMT318 | 2, 5 or 10 meters |
| Probe installation MMT317 | |
| Swagelok® | NPT 1/2", ISO 3/8" or ISO 1/2" |
| Probe installation MMT318 | |
| Fitting bodies | ISO 1/2", NPT 1/2" |
| Ball Valve Set | BALLVALVE-1 |
| Complies with EMC standard EN61326-1, Industrial environment | |

Note: When using the current output, the RF field susceptibility level according to standard EN61000-4-3 with a frequency band of 110 ... 165 MHz, is only 3 V/m (generic environment) with the specified accuracy.

HUMICAP® is a registered trademark of Vaisala.

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# MMT162 Compact Moisture in Oil and Temperature Transmitter for OEM Applications

*The MMT162 enables on-line moisture monitoring in oils even in the most demanding applications.*

## Features/Benefits

- Continuous measurement of moisture in oil
- Measures in lubrication, hydraulic and transformer oils
- Excellent pressure and temperature tolerance
- Vaisala HUMICAP® Sensor - proven in the field since 1973
- Measures water activity - ppm-calculation available for transformer oil
- Small size, easy to integrate
- NIST traceable calibration (certificate included)

The Vaisala HUMICAP® Moisture and Temperature Transmitter for Oil MMT162 is an excellent economical solution for reliable on-line detection of moisture in oil.

### Reliable Vaisala HUMICAP® technology

The MMT162 incorporates the latest generation of the Vaisala HUMICAP® Sensor. The sensor is developed for demanding moisture measurement in liquid hydrocarbons and has been successfully used in oil applications for over a decade. The sensor's excellent chemical tolerance provides accurate and reliable measurement over the measurement range.

### Water activity measurement

The MMT162 measures moisture in oil in terms of the water activity (aw) and temperature (T). Water activity directly indicates whether there is a risk of free water formation. The measurement is independent of oil type, age and temperature. The ppm calculation for mineral oil based transformer oil is optional in the MMT162.

### Several outputs - one connector

The MMT162 has two analog outputs that can be scaled and the measurement ranges changed. Additionally, the transmitter has an RS-485 serial output. The signals and the unit power travel in the same cable.

An optional LED-cable enables a visual alarm.

### Compact, rugged and intelligent

Due to its compact size, the MMT162 is quickly and easily installed in tight spaces. Units are delivered fully assembled, however, you can re-configure them to suit your needs.

### MM70

In combination with an MM70 indicator, the MMT162 provides an ideal tool for on site calibration. The MI70 indicator can be used as a display, communication, and data-logging device for the MMT162.



# Technical data

## Measured Values

| | |
|---|---|
| WATER ACTIVITY | |
| Measurement range | 0 ... 1 aw |
| Accuracy (including non-linearity, hysteresis and repeatability) | |
| 0 ... 0.9 | ± 0.02 |
| 0.9 ... 1.0 | ± 0.03 |
| Response time | |
| in oil flow (typical) | <1 min (dry-wet) |
| MOISTURE | |
| Calculated moisture content in ppm for mineral transformer oil | |
| TEMPERATURE | |
| Accuracy at +20 °C (+68 °F) | ± 0.2 °C (0.36 °F) |

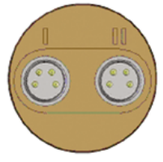
## Operating Environment

| | |
|---|---|
| Operating temperature | -40 ... +60 °C (-40 ... +140 °F) |
| Oil temperature | -40 ... +80 °C (-40 ... +176 °F) |
| Pressure range | |
| metal version | up to 200 bar |
| plastic version | up to 40 bar |
| Oil flow | some flow recommended |

## Outputs

| | |
|---|---|
| Analog outputs (two channels) | |
| current output | 0 ... 20 mA, 4 ... 20 mA |
| voltage output | 0 ... 5 V, 0 ... 10 V |
| Alarm level indication by analog signal | user selectable |
| Digital outputs | RS-485 |

| Pin | I | II |
|---|---|---|
| 1 | Vsupply | Vsupply |
| 2 | Ch 1 | RS-485 - / B |
| 3 | GND | GND |
| 4 | Ch 2 | RS-485 + / A |



## General

| | |
|---|---|
| Sensor | HUMICAP® |
| Cable connections (2 ports) | M8, 4 pin |
| Minimum operating voltage with | |
| RS-485 output | 14 ... 28 VDC |
| voltage output | 16 ... 28 VDC |
| current output | 22 ... 28 VDC |
| Supply current | |
| normal measurement | 20 mA + load current |
| External load for | |
| voltage output | min. 10 kOhm |
| current output | max. 500 Ohm |
| Housing material | |
| metal | AISI 316L |
| plastic | PPS + 40% GF |
| Mechanical connections with bonded seal ring (washer) | |
| metal version | G 1/2" ISO or NPT 1/2" |
| plastic version | G 1/2" ISO |
| Housing classification | IP65 (NEMA 4) |
| Storage temperature range | -40 ... +80 °C (-40 ... +176 °F) |
| Weight | |
| with plastic housing | 65 g (2.3 oz) |
| with metal housing | 200 g (7 oz) |
| Complies with EMC standard EN61326-1, Electrical equipment for measurement control and laboratory use - EMC requirements; Industrial environment | |

## Options and accessories

| | |
|---|---|
| Stainless steel filter (standard) | 221494SP |
| Stainless steel filter for high flow (>1 m/s) | 221493SP |
| Connection cable for MM70 hand-held meter | 219980 |
| USB serial interface cable | 219690 |
| Sealing ring set (U-seal) ISO G1/2, 3 pcs | 221525SP |
| Sealing ring set (copper) ISO G1/2, 3 pcs | 221524SP |
| ISO 1/2" plug | 218773 |
| NPT 1/2" plug | 222507 |
| Sampling cell | DMT242SC |
| Sampling cell w. Swagelok connectors | DMT242SC2 |
| Connection cable | |
| 2 m (6.5 ft), M8 snap-on | 211598 |
| 0.32 m (1 ft) Shielded, M8 threaded | HMP50Z032 |
| 3.0 m (9.8 ft), Shielded, M8 threaded | HMP50Z300 |
| 5.0 m (16.4 ft), Shielded, M8 threaded | HMP50Z500 |
| 10 m (32.8 ft), Shielded, M8 threaded | HMP50Z1000 |
| 3 m, Shielded, connector 90° angle | 221739 |
| 5 m, Shielded, connector 90° angle | 221740 |
| M8 threaded, Ch1 signal + Ch2 LED | MP300LEDCBL |

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# MM70 Hand-Held Moisture and Temperature Meter for Spot-Checking in Oil

*The MM70 is an ideal tool for the preventive maintenance of oil-filled systems. The water activity measurement indicates the margin to free water formation, which causes severe problems in lubrication systems.*

## Features/Benefits

- Measurement independent of oil type, age and temperature
- In-line process checking through ball valve, no need to drain the oil
- Rugged and reliable construction
- Excellent pressure and temperature tolerance
- Data can be logged and transferred to a PC
- Vaisala HUMICAP® Sensor - proven field performance since 1973
- Compatible with Vaisala's fixed oil moisture instruments
- No reference oil needed for recalibration
- NIST traceable (certificate included)

The Vaisala HUMICAP® Hand-held Moisture Meter for Oil MM70 enables reliable detection of moisture in oil.

### In-line process checking through ball valve

The probe can be inserted directly into the process pipe through a ball valve without draining the oil in the system.

### Water activity measurement

The MM70 measures moisture in oil in terms of the water activity (aw) and temperature (T). Water activity directly indicates whether there is a risk of free water formation. The measurement is independent of oil type, age and temperature.

### ppm calculation included

The MM70 has an embedded model for expressing moisture as ppm in mineral transformer oil. The customer can enter up to three other oil models into the meter's memory.

### Numerical and graphical display

The MM70 features a multilingual, menu-based user interface and a backlit LCD display. The measurement parameters can be numerically and graphically displayed and logged into the meter's memory at the same time. An analog output option is also available.

### Connection to PC

The optional MI70 Link Windows® software in combination with a USB connection cable is used to transfer logged data and real time measurement data from the MM70 to a PC.

### Proven Vaisala HUMICAP® technology

The MM70 incorporates the latest generation of the Vaisala HUMICAP® Sensor, developed for demanding moisture measurements in liquid hydrocarbons. The sensor's excellent chemical tolerance provides accurate and reliable measurement over the measurement range.

### Speedy service - once a year

The meter can be recalibrated by sending the probe to Vaisala Service, or customers can calibrate the instrument themselves using a standard relative humidity calibration.

### Multi-probe operation

One or two probes can be connected simultaneously. Maintenance teams can use additional Vaisala dewpoint or relative humidity probes for other tasks. For example, a dewpoint probe is ideal for checking the moisture inside washed and dried oil tanks.



# Technical data

## Performance

| | |
|---|---|
| WATER ACTIVITY | |
| Measurement range $a_w$ | 0 ... 1 |
| Accuracy (including nonlinearity, hysteresis and repeatability) | |
| When calibrated against salt solutions (ASTM E104-85): | |
| 0 ... 0.9 | ±0.02 |
| 0.9 ... 1.0 | ±0.03 |
| Maximum achievable accuracy when calibrated against high-quality, certified humidity standards: | |
| 0 ... 0.9 | ±0.01 |
| 0.9 ... 1.0 | ±0.02 |
| Response time (90%) at +20 °C (+68 °F) in still oil (with stainless steel filter) | 10 min. |
| Sensor | Vaisala HUMICAP® |
| Recommended recalibration interval | 1 year |
| TEMPERATURE | |
| Measurement range | -40 ... +100 °C (-40 ... +212 °F) |
| Typical accuracy at +20 °C | ±0.2 °C (±0.36 °F) |
| Typical temperature dependence of electronics | ±0.005 °C/°C (±0.005 °F/°F) |
| Sensor | Pt 100 IEC 751 1/3 class B |
| Typical long-term stability | better than 0.01 aw / year |

## Operating environment

| | |
|---|---|
| PROBE | |
| Operating temperature range for electronics | -40 ... +60 °C (-40 ... +140 °F) |
| Operating pressure range | max. 20 bar |
| during installation through ball valve | max. 10 bar |
| Oil flow range | max. 1 m/s |
| INDICATOR | |
| Operating temperature range | -10 ... +40 °C (+14 ... +104 °F) |
| Operating humidity range | non-condensing |
| ELECTROMAGNETIC COMPATIBILITY | |
| Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Portable equipment. | |

## Inputs and outputs

| | |
|---|---|
| Power supply | Rechargeable NiMH battery pack with AC-adapter or 4xAA-size alkalines, type IEC LR6 |
| Battery operation time | |
| continuous use | 48 h typical at +20 °C (+68 °F) |
| data logging use | up to a month, depending on logging interval |
| Menu languages | English, Chinese, Spanish, French, German, Japanese, Russian, Swedish, Finnish |
| Display | LCD with backlight, graphic trend display of any parameter, character height up to 16 mm |
| Analog output | 0 ... 1 VDC |
| Output resolution | 0.6 mV |
| PC interface | MI70 Link software with USB or serial port cable |
| Data logging capacity | 2700 points |
| Alarm | Audible alarm function |

## Mechanics

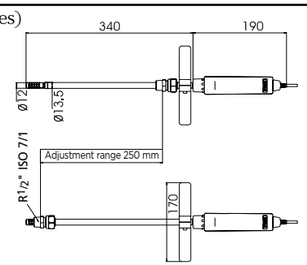
| | |
|---|---|
| PROBE | |
| Housing classification | IP65 (NEMA 4) |
| Housing material | ABS/PC blend |
| Probe material | Stainless steel (AISI316L) |
| Cable length between probe and indicator | 1.9 m, 10 m extension available |
| Weight | 506 g |
| INDICATOR | |
| Housing classification | IP54 |
| Weight | 400 g |
| Probe inputs | 1 or 2 |

## Options and accessories

| | |
|---|---|
| Carrying case | MI70CASE2 |
| Ball valve set (incl. fitting body & blanking plug) | HMP228BVS |
| Probe cable extension, 10 m | 213107SP |
| Transmitter connection cables for | |
| HMP228 | 27159ZZ |
| MMT318 | DRW216050 |
| MMT/HMT330/DMT340 | 211339 |
| MI70 Link software with USB cable | 219687 |
| MI70 Link software with serial port cable | MI70LINK |
| Analog output cable | 27168ZZ |
| Sensor protection | HM47453SP |
| Dewpoint measurement probes | DMP74A/B |
| Relative humidity measurement probes | HMP75, HMP76, HMP77 |

## Dimensions

Dimensions in mm (inches)

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# GMP343 Carbon Dioxide Probe for Demanding Measurements

*The GMP343 is available as an open-path diffusion-aspirated model (left) and as a flow-through model (right).*

## Features/Benefits

- Excellent accuracy and stability
- Vaisala CARBOCAP® Sensor, a silicon-based non-dispersive infrared (NDIR) sensor
- A single-beam, dual-wavelength $CO_2$ measurement with no moving parts
- Compensation options for temperature, pressure, humidity and oxygen
- Low power consumption and heat emission
- Designed for outdoor use
- Compact and lightweight

The Vaisala CARBOCAP® Carbon Dioxide Probe GMP343 is an accurate and rugged probe-type instrument for ecological measurements. Typical applications include $CO_2$ soil respiration, ambient $CO_2$ monitoring, plant growth chambers, and OEM applications.

The GMP343 can output both numerically filtered and raw measurement data and it can also compensate the measurement with an internal temperature measurement and user-set relative humidity, pressure and oxygen values.

In combination with an MI70 indicator, the GMP343 provides a tool for accurate in-situ measurement. The MI70 can be used as a display, communication and data logging device.

Each GMP343 is calibrated using ±0.5 % accurate gases at 0 ppm, 200 ppm, 370 ppm, 600 ppm, 1000 ppm, 4000 ppm and 2 %. Calibration is also done at temperature points of -30 °C, 0 °C, 25 °C and 50 °C. If needed, the customer can recalibrate the instrument using the multipoint calibration (MPC) feature allowing up to 8 user-defined calibration points.

# Technical data

## Performance

| | |
|---|---|
| Measurement range options | 0 ... 1000 ppm, 0 ... 2000 ppm, 0 ... 3000 ppm, 0 ... 4000 ppm, 0 ... 5000 ppm, 0 ... 2 % |

Accuracy (excluding noise) at 25 °C (77 °F) and 1013 hPa after factory calibration with 0.5 % accurate gases with different range options

| | |
|---|---|
| 0 ... 1000 ppm | ±(3 ppm + 1 % of reading) |
| 0 ... 2000 ppm - 0 ... 2 %* | ±(5 ppm + 2 % of reading) |

*Accuracy below 200 ppm $CO_2$ not specified for 2 % range option

Noise (repeatability) at 370 ppm $CO_2$

| | |
|---|---|
| with no output averaging | ±3 ppm $CO_2$ |
| with 30 s output averaging | ±1 ppm $CO_2$ |

TEMPERATURE

Effect on accuracy **with** temperature compensation:

| $CO_2$ range options | 0 ... 1000 ppm | 0 ... 2 000 - 5000 ppm | 0 ... 2 % |
|---|---|---|---|
| Temperature °C (°F) | Accuracy (% of reading) | | |
| +10 ... +40 (+50 ... +104) | ±1 | ±1 | ±2 |
| +40 ... +60 (+104 ... +140) | ±2 | ±3 | ±4 |
| -40 ... +10 (-40 ... +50) | ±3 | ±3 | ±5 |

For readings below 200 ppm $CO_2$ ±5 ppm $CO_2$

Temperature compensation is performed by an integrated Pt1000 element



# Technical data

PRESSURE

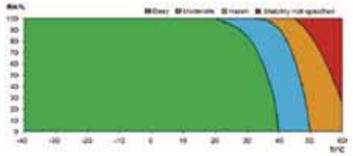
Effect on accuracy **with** pressure compensation:

| $CO_2$ range options | 0 ... 1000 ppm | 0 ... 2000 - 2 % |
|---|---|---|
| Pressure (hPa) | Accuracy (% of reading) | |
| 900 ... 1050 | ±0.5 | ±1 |
| 700 ... 1300 | ±1 | ±2 |

Integrated pressure sensor is **not** included in GMP343

| | |
|---|---|
| Long term stability | see graph below |
| easy | <±2 % of reading / year |
| moderate | <±2 % of reading / 6 months |
| harsh | <±2 % of reading / 3 months |

GMP343 OPERATING CONDITIONS



Response time (90 %)

DIFFUSION MODEL

| Filter attached | Averaging (s) | Response (s) |
|---|---|---|
| Yes | 0 | 75 |
| Yes | 30 | 82 |
| No | 0 | <2 |
| No | 30 | 30 |

FLOW-THROUGH MODEL

| Gas flow (l/min) | Averaging (s) | Response (s) |
|---|---|---|
| 0.3 | 0 | 26 |
| 0.3 | 30 | 44 |
| 1.2 | 0 | 8 |
| 1.2 | 30 | 23 |

| | |
|---|---|
| Warm-up time | |
| full accuracy ±0.5 % | 10 min |
| full accuracy | 30 min |

## Operating Environment

| | |
|---|---|
| Temperature | |
| operating | -40 ... +60 °C (-40 ... +140 °F) |
| storage | -40 ... +70 °C (-40 ... 158 °F) |
| Humidity | see graph 'GMP343 Operating Conditions' |
| Pressure | |
| compensated range | 700 ... 1300 hPa |
| operating | <5 bar |
| Gas flow for flow-through model | 0 ... 10 liters/min |
| Electromagnetic compatibility | EN61326, Generic Environment |

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 11 ... 36 VDC |
| Power consumption | |
| without optics heating | <1 W |
| with optics heating | <3.5 W |
| ANALOG OUTPUTS | |
| Current output | |
| range | 4 ... 20 mA |
| resolution | 14 bits |
| max. load | 800 Ohm @ 24 VDC, 150 Ohm @ 10 VDC |
| Voltage output | |
| range | 0 ... 2.5 V, 0 ... 5 V |
| resolution | 14 bits (13 bits with 0 ... 2.5 V) |
| min. load | 5 kOhm |
| DIGITAL OUTPUTS | RS485, RS232 |

## Materials

| | |
|---|---|
| Housing | anodized aluminium |
| Filter cover | PC |
| IP classification | <1 W |
| Housing (cable attached) | IP67 |
| Diffusion filter (weather protection) | IP65 |
| Diffusion filter (sintered PTFE) | IP66 |
| Cable connector type | 8-pin M12 |
| Weight (probe only) | 360 g |

## Options and accessories

| | |
|---|---|
| Wall mount bracket | GMP343BRACKET |
| Mounting flange | GMP343FLANGE |
| Standard diffusion filter (weather protection, IP65) +filter cover | GMP343FILTER |
| Diffusion filter (sintered PTFE filter, IP66) + filter cover | 215521 |
| Calibration adapter (for the diffusion model) | GMP343ADAPTER |
| Junction box | JUNCTIONBOX-8 |
| Probe cables | |
| 2m | GMP343Z200SP |
| 6m | GMP343Z600SP |
| 10m | GMP343Z1000SP |
| PC connection cable, 2m | 213379 |
| MI70 connection cable, 2m | DRW216050SP |
| USB adapter (USB-D9 Serial connection cable) | 219686 |
| Soil adapter kit for horizontal positioning | 215519 |
| Soil adapter kit for vertical positioning | 215520 |

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# GMT220 Series Carbon Dioxide Transmitters for Industrial Applications

*The GMT220 transmitters withstand harsh and humid environments.*

## Features/Benefits

- Incorporates Vaisala CARBOCAP® - the silicon-based NDIR sensor
- IP65 protected against dust and spray water
- Several measurement ranges
- Easy installation
- Standard analog outputs and two configurable relays available

Applications include:

- Horticulture and fruit storage
- Greenhouses and mushroom farming
- Safety alarming and leakage monitoring
- Demand controlled ventilation in harsh environments

The Vaisala CARBOCAP® Carbon Dioxide Transmitter Series GMT220 is designed to measure carbon dioxide in harsh and humid environments. The housing is dust- and waterproof to IP65 standards.

The GMT220 series transmitters incorporate the advanced Vaisala CARBOCAP® Sensor. The patented sensor has unique reference measurement capabilities. Its critical parts are made of silicon; this gives the sensor outstanding stability over both time and temperature. By lengthening the calibration intervals, the user saves both time and money.

### Interchangeable probes

The user has a choice of measurement ranges up to 20% of $CO_2$. The GMT221 is for higher concentrations of $CO_2$ and the GMT222 for lower concentrations of $CO_2$. The GMT220 probes are interchangeable. They can be removed and reattached or replaced at any time – without the need for calibration and adjustment. The probes can be attached directly to the transmitter body or, when used with a cable, installed remotely into hard-to-reach places or areas with dangerously high levels of $CO_2$.

The interchangeability of the GMT220 transmitter's probes truly facilitates field maintenance.

The end user can carry out field maintenance without any additional equipment or heavy and expensive calibration gas bottles by simply replacing a probe.

Probes that have been replaced can be sent to Vaisala for recalibration.



# Technical data

## Performance

| | |
|---|---|
| Measurement Ranges | |
| GMT221 | 0 ... 2 % |
| for high concentrations | 0 ... 3 % |
| | 0 ... 5 % |
| | 0 ... 10 % |
| | 0 ... 20 % |
| GMT222 | 0 ... 2000 ppm |
| for low concentrations | 0 ... 3000 ppm |
| | 0 ... 5000 ppm |
| | 0 ... 7000 ppm |
| | 0 ... 10 000 ppm |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) at 25 °C and 1013 hPa | |
| GMT221 | ±(1.5 % of range + 2 % of reading) |
| (applies for concentrations above 2 % of full scale) | |
| GMT222 | ±(1.5 % of range + 2 % of reading) |
| Temperature dependence, typical | -0.3 % of reading / °C |
| Pressure dependence, typical | +0.15 % of reading/hPa |
| Long-term stability | <±5 %FS/2 years |
| Response time (63 %) | |
| GMT221 | 20 seconds |
| GMT222 | 30 seconds |
| Warm-up time | 30 seconds, 15 minutes full specifications |

## Inputs and outputs

| | |
|---|---|
| Outputs | 0 ... 20 or 4 ... 20 mA and 0 ... 10 V |
| Resolution of analog outputs | 12 bits |
| Recommended external load: | |
| current output | max. 400 Ohm |
| voltage output | min. 1 kOhm |
| Two pre-or user-defined relay outputs | |
| Relay contacts | max. 30VAC/60VDC, 0.5A |
| Connections | screw terminals, 0.5 ... 1.5 mm² |
| Operating voltage | nominal 24 VAC/DC |
| Power consumption | <4 W |

## Operating environment

| | |
|---|---|
| Operating temperature | -20 ... +60 °C (-4 ... +140 °F) |
| with display | 0 ... +50 °C (+32 ... +122 °F) |
| Storage temperature | -30 ... +70 °C (-22 ... +158 °F) |
| Humidity | 0 ... 100 %RH, non-condensing |
| Electromagnetic compatibility | EN61326-1, Generic Environment |

## Mechanics

| | |
|---|---|
| Housing material | |
| transmitter body | ABS plastic |
| probe | PC plastic |
| Housing classification | IP65 |
| Weight: | |
| GMT221 | max. 280 g |
| GMT222 | max. 300 g |
| Probe cable length | 2 m and 10 m (optional) |

## Accessories

| | |
|---|---|
| Spare probe | GMP221, GMP222 |
| (use the order form to define measurement range etc.) | |
| Clips (2 pcs) for attaching the probe | 25245GM |
| Mounting flange for the probe | GM45156 |
| Probe cables | |
| 2 m | 25665GMSP |
| 10 m | 210848GMSP |
| Calibrator for interchangeable probes | GMK220 |
| Wall Assembly Plate | GM45160 |
| In-soil adapter for probe | 211921GM |
| Serial COM adapter | 19040GM |
| Calibration adapter for probe | 26150GM |

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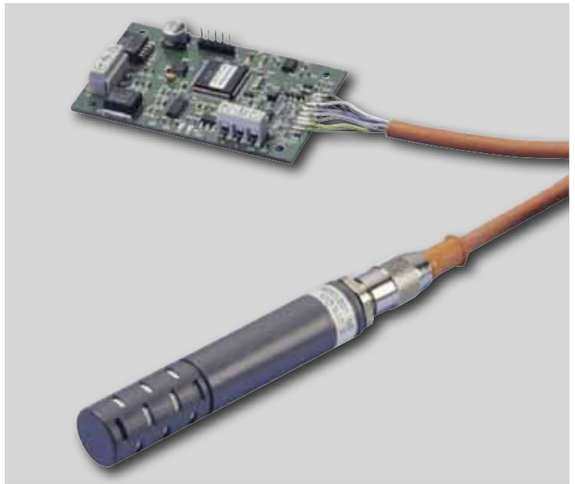
# GMM220 Carbon Dioxide Modules for Demanding OEM Applications



*The Vaisala CARBOCAP® Carbon Dioxide Module Series GMM220 withstand harsh conditions. They provide high carbon dioxide measurement accuracy over wide temperature and relative humidity ranges.*

## Features/Benefits

- Incorporates Vaisala CARBOCAP® - the silicon based $CO_2$ sensor
- Choice of several measurement ranges
- IP65 protected probe against dust and spray water
- Interchangeable probes provide easy maintenance
- Modules optimized for integration into equipment for greenhouse control, incubators, fermentors, safety alarming and integrated systems.

## For harsh environments

The Vaisala CARBOCAP® Carbon Dioxide Module Series GMM220 are designed for Original Equipment Manufacturers (OEM's) requiring carbon dioxide measurements in harsh and demanding applications.

## Vaisala CARBOCAP®

The GMM220 series modules incorporate the industrial Vaisala CARBOCAP® Sensor. The patented sensor has unique reference measurement capabilities. Its critical parts are made of silicon; this gives the sensor outstanding stability over both time and temperature.

Since water vapor, dust, and most chemicals do not affect the measurement, the GMM220 series modules can be used in harsh and humid environments.

## Interchangeable probes

The GMP220 probes are interchangeable. They can be removed, reattached or replaced at any time – without the need for calibration and adjustment. The interchangeable probes make calibration and field service easy. In addition, the measurement range can be changed simply by replacing one probe with another.

## Different configurations

The user has a choice of measurement ranges up to 20 % $CO_2$: the Vaisala CARBOCAP® Carbon Dioxide Module GMM221 for higher and the Vaisala CARBOCAP® Carbon Dioxide Module GMM222 for lower concentrations of $CO_2$.

Different power supply voltages, output options, as well as cable lengths, connectors, and mounting gear are also available.



# Technical data

## Carbon dioxide

| | |
|---|---|
| Measurement ranges | |
| GMM221 for high concentrations | 0 ... 2 %, 0 ... 3 %, 0 ... 5 %, 0 ... 10 %, 0 ... 20 % |
| GMM222 for low concentrations | 0 ... 2000 ppm, 0 ... 3000 ppm, 0 ... 5000 ppm, 0 ... 7000 ppm, 0 ... 10 000 ppm |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) at 25 °C and 1013 hPa | |
| GMM221 | ±(1.5% of range + 2% of reading) |
| (applies for concentrations above 2% of full scale) | |
| GMM222 | ±(1.5% of reading + 2% of reading) |
| Temperature dependence, typical | -0.3 % of reading / °C |
| Pressure dependence, typical | +0.15% of reading hPa |
| Long-term stability | <±5 %FS/2 years |
| Response time (63 %) | |
| GMM221 | 20 seconds |
| GMM222 | 30 seconds |
| Warm-up time | 30 seconds, 15 minutes full specifications |

## Inputs and outputs

| | |
|---|---|
| Outputs | 0 ... 20 or 4 ... 20 mA, 0 ... 1 V, 0 ... 2V, 0 ... 2.5 V, or 0 ... 5 V |
| Resolution of analog outputs | 12 bits |
| Recommended external load: | |
| current output | max. 200 Ohm |
| voltage output | min. 1 kOhm |
| Operating voltage | 11 ... 20 VDC or 18 ... 30 VDC |
| Connections | screw terminals, wire size 0.5 ... 1.5 $mm^2$ |
| Power consumption | <2.5 W |

## Operating environment

| | |
|---|---|
| Operating temperature | -20 ... +60 °C (-4 ... +140 °F) |
| Storage temperature | -30 ... +70 °C (-22 ... +158 °F) |
| Operating pressure | 700 ... 1300 hPa |
| probe | 0 ... 100 %RH, non-condensing |
| mother board | 0 ... 85 %RH, non-condensing |
| Electromagnetic compatibility | EN61326-1, Generic Environment |

## Mechanics

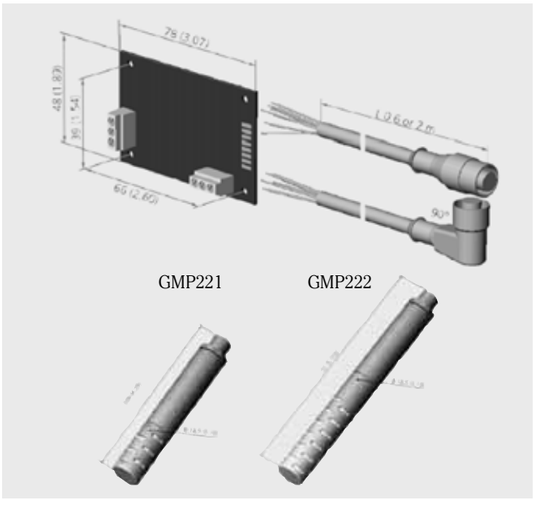
| | |
|---|---|
| Probe housing material | PC plastic |
| Housing classification (probe only) | IP65 |
| Weight: GMM221 (w/2m cable) | max. 180 g |
| Weight: GMM222 (w/2m cable) | max. 200 g |
| Probe cable length | 0.6 m, 1 m (high temperature cable), 2 m, 6 m or 10 m (optional) |

## Accessories

| | |
|---|---|
| Spare probe | GMP221, GMP222 |
| (use the order form to define measurement range etc.) | |
| Clips (2 pcs) for attaching the probe | 25245GM |
| Mounting flange for the probe | GM45156 |
| $CO_2$ Calibration Unit | GMK220 |
| Probe cables | |
| 1 m high temperature probe cable (180 °C / 365 °F) | GMM220Z100SP |
| 2 m probe cable | GMM220Z200SP |
| 6 m probe cable | GMP343Z600SP |
| 10.0 m probe cable | GMP343Z1000SP |
| Serial COM adapter | 19040GM |

## Dimensions

Dimensions in mm (inches)

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# GMM111 Carbon Dioxide Module

*The Vaisala CARBOCAP® Carbon Dioxide Module GMM111 is a $CO_2$ measurement module with flow-through aspiration.*

## Features/Benefits

- Compact $CO_2$ module with flow-through aspiration
- Ideal for control of $CO_2$ concentrations in incubators
- Incorporates Vaisala CARBOCAP®, the silicon based NDIR sensor with unique internal referencing
- Advanced single-beam, dual wavelength measurement with no moving parts
- Measurement range options 0 ... 5 %, 0 ... 10 % and 0 ... 20 % $CO_2$
- Excellent long-term stability

## GMM111

The Vaisala CARBOCAP® Carbon Dioxide Module GMM111 is designed especially for control of biological processes where high $CO_2$ concentrations are used. It has 3 optional measurement ranges 0 ... 5/10/20 % $CO_2$. The GMM11 is a flow-trough model and has barbed conncectors for attaching the in and out flow tubes. As the module is not mounted in the chamber, the chamber can be heatsterilized without removing the module.

The Vaisala CARBOCAP® $CO_2$ sensors have been proven to be accurate anddurable. They have an excellent long-term stability, which decreases maintenance. The superior performance of Vaisala CARBOCAP® sensors results largely from the stable reference provided by the electrically tunable Fabry-Perot Interferometer(FPI).

The tunable FPI filter measures $CO_2$ absorption, and simultaneously a reference wavelength. This internal reference measurement compensates effectively for any changes in the optical path, such as light source intensity changes and contamination. In the HVAC market, this type of reference measurement is a unique feature to Vaisala CARBOCAP® products.

The true internal reference measurement of Vaisala CARBOCAP® $CO_2$ transmitters provides years of stable $CO_2$ measurements.



# Technical data

## Performance

| | |
|---|---|
| $CO_2$ measurement range | 0 ... 5 %, 0 ... 10 % or 0 ... 20 % |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) | ±(1.5% of range + 3 % of reading) |
| Long-term stability | ±1 % $CO_2$/2 years |
| Response time $T_{90}$ | 1 min at 0.5 l/min flow |
| Flow rate dependence | |
| < 1 l/min flow | no effect |
| 1 ... 10 l/min flow | 4 % of reading/ l/min |
| Temperature dependence, typical | -0.3 % of reading/°C |
| Pressure dependence, typical | +0.15 % of reading/hPa |
| Warm-up time | 1 min, 10 min for full specifications |
| Product lifetime | > 10 years |

## Operating environment

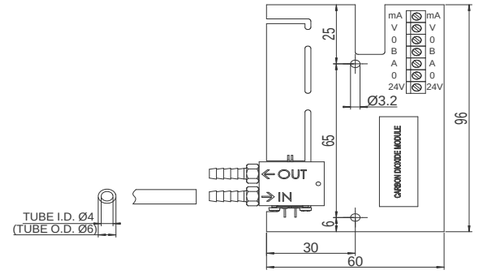
| | |
|---|---|
| Temperature | +5 ... +55 °C (+41 ... +131 °F) |
| Humidity | 0 ... 99 %RH non-condensing |
| Pressure | 700 ... 1200 hPa |
| Gas flow | |
| operating range | < 10 l/min |
| recommended range | 0.2 ... 0.8 l/min |
| Electromagnetic compatibility | |
| Complies with EMS Standard EN61326-1, Generic Environment | |

## Inputs and outputs

| | |
|---|---|
| Outputs | 4 ... 20 mA, 0 ... 10 V |
| | RS485, 2-wire, non-isolated |
| Operating voltage | 24 V (±20 %) AC/DC |
| Power consumption | <2 W |

## Dimensions

Dimensions in mm

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CE

# GM70 Hand-Held Carbon Dioxide Meter for Spot-Checking Applications

*The Vaisala CARBOCAP® Hand-Held Carbon Dioxide Meter GM70 is the demanding professional's choice for hand-held carbon dioxide measurement. The meter consists of the indicator (center) and probe, used either with the handle (left) or pump (right).*

## Features/Benefits

- Proven Vaisala CARBOCAP® reliability
- Two optional sampling methods: diffusion or pump aspiration
- User-friendly meter with multilingual user interface
- Numerical and graphical display of measurements
- Data can be logged and transferred to PC via MI70 Link software
- Wide selection of measurement ranges
- Easy recalibration using the interchangeable probes
- Suitable for field checking of fixed $CO_2$ instruments
- Short warm-up time
- Compact and versatile

The Vaisala CARBOCAP® Hand-Held Carbon Dioxide Meter GM70 is a user-friendly meter for demanding spot measurements in laboratories, greenhouses and mushroom farms. The meter can also be used in HVAC and industrial applications, and as a tool for checking fixed $CO_2$ instruments.

The GM70 has a short warm-up time and is ready for use almost immediately. It has a menu-based interface, a graphical LCD display and data logging capability. The optional MI70 Link Windows® software in combination with a USB connection cable provides an easy way to handle data in a PC environment.

## Vaisala CARBOCAP® technology

The GM70 incorporates the advanced Vaisala CARBOCAP® sensor that has unique reference measurement capabilities. The measurement accuracy is not affected by dust, water vapor or most chemicals. The GM70 has a two-year recommended calibration interval.

## Two sampling methods

The handle is for hand-held diffusion sampling. The GM70 pump enables pump-aspirated sampling from locations difficult to access otherwise. It is also ideal for comparisons with fixed $CO_2$ transmitters.

## Interchangeable probes

The GM70 uses the same probes as Vaisala CARBOCAP® Carbon Dioxide Transmitter Series GMT220 and Modules Series GMM220. By plugging different probes into the handle or pump, the user can easily change the measurement range of the GM70.

The meter can also be used as a calibration check instrument for Vaisala's GM20 and series, GMT/M220 fixed $CO_2$ instruments. GMP220 probes can even be adjusted by using the GM70 meter.

The GM70 has two probe inputs. Vaisala's relative humidity and dewpoint probes can also be used simultaneously with $CO_2$ measurement.



# Technical data

### $CO_2$ volume concentration measurement

| | |
|---|---|
| Measurement ranges | |
| High concentrations | 0 ... 2 % |
| short probe (GMP221) | 0 ... 3 % |
| | 0 ... 5 %, 0 ... 10 %, 0 ... 20 % |
| Low concentrations | 0 ... 2000 ppm |
| long probe (GMP222) | 0 ... 3000 ppm, 0 ... 5000 ppm, |
| | 0 ... 7000 ppm, 0 ... 10,000 ppm |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) at 25 °C and 1013 hPa | |
| GMP221 | ±(1.5% of range + 2% of reading) |
| (applies for concentrations above 2% of full scale) | |
| GMP222 | ±(1.5% of range + 2% of reading) |
| Temperature dependence, typical | -0.3 % of reading / °C |
| Pressure dependence, typical | +0.15% of reading/hPa |
| Long-term stability | <±5 %FS/2 years |
| Response time (63 %) | |
| GMP221 | 20 seconds |
| GMP222 | 30 seconds |
| Warm-up time | 30 seconds, 15 minute full specifications |

### Measurement environment

| | |
|---|---|
| Temperature | -20 ... +60 °C (-4 ... +140 °F) |
| Relative humidity | 0 ... 100 %RH non-condensing |
| Operation pressure | 700 ... 1300 hPa |
| Flow range (diffusion sampling) | 0 ... 10 m/s |

### Probe, handle & pump general

| | |
|---|---|
| Sensor | Vaisala CARBOCAP® |
| Housing material | |
| GMP221/222 probe | PC plastic |
| GMH70 handle | ABS/PC blend |
| GM70 Pump | aluminium casing |
| Storage temperature | -30 ... +70 °C (-22 ... +158 °F) |
| Storage humidity | 0 ... 100 %RH non-condensing |
| Weight | |
| GMH70 with GMP221/222 probe | 230 g |
| GM70 Pump with GMP221/222 probe | 700 g |

### MI70 Indicator general

| | |
|---|---|
| Menu languages | English, Chinese, French, Spanish, German, Japanese, Russian, Swedish, Finnish |
| Display | LCD with backlight, graphic trend display of any parameter, character height up to 16 mm |
| Max. no. of probes | 2 |
| Power supply | Rechargeable NiMH battery pack with AC-adapter |
| Analog output | 0 ... 1 VDC |
| Output resolution | 0.6 mV |
| PC interface | MI70 Link software with USB or serial port cable |
| Data logging capacity | 2700 points |
| Alarm | Audible alarm function |
| Operating temperature range | -10 ... +40 °C (+14 ... +104 °F) |
| Operating humidity range | non-condensing |
| Housing material | ABS/PC blend |
| Housing classification | IP54 |
| Weight | 400 g |

### Battery operation time

| | |
|---|---|
| Continuous use | |
| with handle | better than 8h at +20 °C (+68 °F) |
| with pump | better than 5h at +20 °C (+68 °F) without load |
| Data logging use | up to a month, depending on logging interval |

### Electromagnetic compatibility

EN 61326-1, Portable Equipment.

### Accessories

| | |
|---|---|
| Connection cable for fixed $CO_2$ instruments GMT220, GMM220, GMD20 and GMW20 | GMA70 |
| MI70 Link software with USB cable | 219687 |
| MI70 Link software with serial port cable | MI70LINK |
| Analog output cable for 0 ... 1 VDC | 27168ZZ |
| Calibration adapter | 26150GM |
| Carrying case | MI70CASE |
| Battery, NiMH 4.8V | 26755 |
| Spare probe | GMP221, GMP222 |
| (use the order form to define measurement range etc.) | |
| Nafion Membrane Tubing | 212807GM |

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# GMW115 Carbon Dioxide Transmitter for Demand-controlled Ventilation

*The Vaisala CARBOCAP® Carbon Dioxide Transmitter GMW115 is a wall-mounted $CO_2$ transmitter for demand-controlled ventilation.*

## Features/Benefits

- Compact, wall-mounted transmitter for demand-controlled ventilation
- Incorporates Vaisala CARBOCAP®, the silicon based NDIR sensor with unique internal referencing
- Advanced, single-beam, dual wavelength measurement with no moving parts
- Excellent long-term stability
- Ideal for ventilation control in all types of occupied spaces

Most of us spend 90 % of our time indoors. Consequently, good indoor air quality is important to our wellbeing. All human beings produce carbon dioxide gas by respiration, thus the carbon dioxide level can be used as an indicator for indoor human presence. A high $CO_2$ level is a sign of poor ventilation and often an indication of other unpleasant odors in the air. In many buildings the ventilation need varies throughout the day. Demand controlled ventilation is an economical way to ensure good air quality.

The Vaisala CARBOCAP® $CO_2$ sensors have been proven to be accurate and durable. They have an excellent long-term stability, which decreases maintenance. The superior performance of Vaisala CARBOCAP® sensors results largely from the stable reference provided by the electrically tunable Fabry-Perot Interferometer (FPI).

The tunable FPI filter measures $CO_2$ absorption, and simultaneously a reference wavelength. This internal reference measurement compensates effectively for any changes in the optical path, such as light source intensity changes and contamination. In the HVAC market, this type of reference measurement is a unique feature to Vaisala CARBOCAP® products, distinguishing them from competitors' comparative products that do not have a reference measurement at all, or have an indirect reference measurement, which is based on an assumed background $CO_2$ levels. In buildings with around-the-clock occupancy (e.g. hospitals, work-places, residential buildings, retirement homes), the assumed background $CO_2$ level reference is simply not applicable. The true internal reference measurement of Vaisala CARBOCAP® $CO_2$ transmitters provides years of stable $CO_2$ measurements.

The GMW115 Transmitter is designed especially for DCV (Demand Controlled Ventilation) applications with two optional $CO_2$ measurement ranges of 0…2000 ppm and 0…5000 ppm.



# Technical data

## Performance

| | |
|---|---|
| $CO_2$-measurement range | 0 ... 2000 ppm<br>0.....5000 ppm |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) | ±(2 % of range + 2 % of reading) |
| Long-term stability | ± 5 % of range/5 years |
| Response time T90 | 1 min |
| Temperature dependence, typical | -0,35 % of reading / °C |
| Pressure dependence, typical | +0,15 % of reading/hPa |
| Warm-up time | 1 min, 10 min for full. specification |
| Product lifetime | > 10 years |

## Operating environment

| | |
|---|---|
| Temperature | -5 ... +45 °C (23 ... 113 °F) |
| Humidity | 0 ... 85 %RH |
| Pressure | 700 ... 1200 hPa |
| Electromagnectic compatibility | Complies with EMS standard EN61326-1, Generic Environment |

## Inputs and outputs

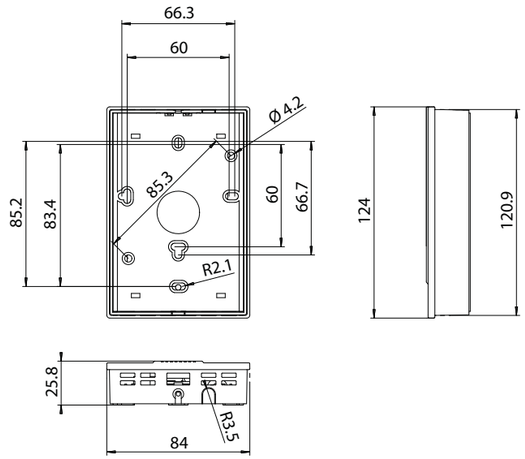
| | |
|---|---|
| Operating voltage | 24 V (±20 %) AC/DC |
| Power consumption | <2 W |
| Outputs | 4 … 20 mA, 0 … 10 V, RS-485, 2-wire, non-isolated |

## Housing

| | |
|---|---|
| Material: | ABS plastics |
| Colour: | Cycolac 233599/NCS 0502-G50Y |
| Fire resistance: | UL94 HB |
| Ingress protection: | IP30 |

## Dimensions

Dimensions in mm



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# GMD/W20 Series Carbon Dioxide Transmitters for Demand Controlled Ventilation Applications

*The GMD/W20 series transmitters are designed for use in ventilation-related applications.*

## Features/Benefits

- Versatile transmitters
- Duct and wall mount models
- Incorporates Vaisala CARBOCAP® Sensor - the silicon-based NDIR sensor
- Excellent long-term stability
- Negligible temperature dependence
- Ease of installation

The duct mounted Vaisala CARBOCAP® Carbon Dioxide Transmitter Series GMD20 and wall mounted GMW20 are specially designed for Demand Controlled Ventilation (DCV). They are easy to install and require no maintenance. The recommended calibration interval is five years.

## Vaisala CARBOCAP® technology

The GMD/W20 Series Transmitters use the silicon-based Vaisala CARBOCAP® Sensor. The simple structure and reference measurement capabilities make this Single-Beam, Dual-Wavelength NDIR sensor extremely stable and reliable.

The temperature and flow dependences of the sensor are negligible. In addition, the measurement accuracy is not affected by dust, water vapor and most chemicals.

## Versatile transmitters

The GMD/W20 series transmitters can be used independently, or incorporated into building energy management systems. The series consists of duct mount units GMD20/D and wall mount units GMW21/D and GMW22/D. Version D has a display. The two sizes in the wall-mount series make them easy to install for most standard junction boxes.

The duct units' compact sensor head design requires only a small hole in a ventilation duct, thereby minimizing the risk of leaking gaskets and measurement errors.

In addition to the standard 0 ... 20 mA, 4 ... 20 mA and 0 ... 10 V outputs, there are three other options: two LonWorks® interfaces and a relay output. The relay output is standard with the display units.

## Improve indoor air at minimal energy costs

The use of the GMD/W20 series transmitters ensures the best possible control of air quality and results in considerable savings in energy consumption, maintenance and recalibration costs.

## Temperature option

The GMA20T temperature module, an option with the GMW21 wall mount unit, combines both $CO_2$ and temperature measurement into one transmitter. The GMA20T has an output of 0 ... 10 V corresponding to a temperature range of 0 ... +50 °C (+32 ... +122 °F).



# Technical data

## Performance

| | |
|---|---|
| CARBON DIOXIDE MEASUREMENT | |
| Measurement range | 0 ... 2000 ppm (nominal; can be calibrated for other ranges: 0 ... 5000 ppm, 0 ... 10,000 ppm, 0 ... 20,000 ppm) |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) | ± (2 % of range + 2% of reading) |
| Long-term stability | <±5 % of range / 5 years |
| Response time (63%) | 1 minute |
| Warm-up time | 1 minute, 15 minutes full specifications |
| TEMPERATURE MEASUREMENT (OPTIONAL WITH GMW21) | |
| Output signal | 0 ... 10V |
| Corresponding measurement range | 0 ... +50 °C (+32 ... +122 °F) |
| Accuracy at +25 °C | ±0.5 °C (0.9 °F) |
| Warm up time | 30 min |
| Temperature sensor | Semiconductor IC |

## Inputs and outputs

| | |
|---|---|
| Outputs | 0 ... 20 or 4 ... 20 mA and 0 ... 10 V |
| Optional outputs | relay<br>LonWorks® interface |
| Resolution of analog outputs | 8 bits |
| Recommended external load: | |
| current output | max. 500 ohm |
| voltage output | min. 1 kohm |
| Operating voltage | nominal 24 VAC/DC (18 ... 30 VDC) |
| Connections | screw terminals, wire size 0.5 ... 1.5 mm² |
| Power consumption | <2.5 W |

## Operating environment

| | |
|---|---|
| Temperature | -5 ... +45 °C (+23 ... +113 °F) |
| Humidity | 0 ... 85 %RH, non-condensing |
| Flow velocity (GMD20) | 0 ... 10 m/s |
| Electromagnetic compatibility | EN61326-1, Generic Environment |

## Mechanics

| | |
|---|---|
| Housing material | ABS plastic |
| Housing classification (GMD20 electronics housing) | IP65 |
| Housing colour GMW21/22 | NCS 0502-G50Y |
| Weight: | |
| GMD20 (D) | 140 g (170 g) |
| GMW21 (D) | 100 g (130 g) |
| GMW22 (D) | 90 g (120 g) |

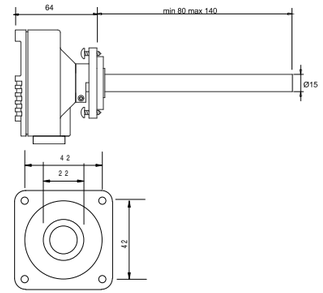
## Accessories and options

| | |
|---|---|
| Display and relay option for GMD/W21/22 | GMI21 |
| Relay output option | GMR20 |
| LonWorks® module with $CO_2$ signal (Not available when display option is added) | GML20 |
| LonWorks® module with both $CO_2$ signal and temperature signals (Not available when display option is added) | GML20T |
| Serial COM adapter | 19040GM |
| Analog temperature module for GMW21 (not available when display option is added) | GMA20T |
| Hand-held meter for field verification | GM70 |

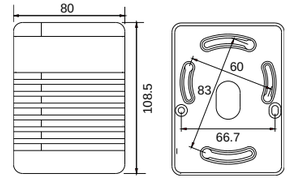
## Dimensions

Dimensions in mm

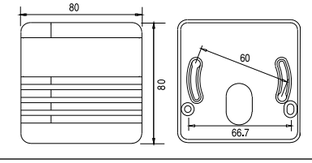
GMD20 and GMD20D




GMW21 and GMW21D




GMW22 and GMW22D

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# GMM112 Carbon Dioxide Module for HVAC Applications

*The Vaisala CARBOCAP® Carbon Dioxide Module GMM112 is a basic $CO_2$ measurement module.*

## Features/Benefits

- Compact, OEM module for demand-controlled ventilation and other $CO_2$ measurement applications
- Incorporates Vaisala CARBOCAP®, the silicon based NDIR sensor with unique internal referencing
- Advanced, single-beam, dual wavelength measurement with no moving parts
- Excellent long-term stability
- Ideal for ventilation control in all types of occupied spaces

Most of us spend 90% of our time indoors. Consequently, good indoor air quality is important to our wellbeing. All human beings produce carbon dioxide gas by respiration, thus the carbon dioxide level can be used as an indicator for indoor human presence. A high $CO_2$ level is a sign of poor ventilation and often an indication of other unpleasant odors in the air. In many buildings the ventilation need varies throughout the day. Demand controlled ventilation is an economical way to ensure good air quality.

The Vaisala CARBOCAP® $CO_2$ sensors have been proven to be accurate and durable. They have an excellent long-term stability, which decreases maintenance. The superior performance of Vaisala CARBOCAP® sensors results largely from the stable reference provided by the electrically tunable Fabry-Perot Interferometer (FPI).

The tunable FPI filter measures $CO_2$ absorption, and simultaneously a reference wavelength. This internal reference measurement compensates effectively for any changes in the optical path, such as light source intensity changes and contamination. In the HVAC market, this type of reference measurement is a unique feature to Vaisala CARBOCAP® products, distinguishing them from competitors' comparative products that do not have a reference measurement at all, or have an indirect reference measurement, which is based on an assumed background $CO_2$ levels. In buildings with around-the-clock occupancy (e.g. hospitals, work-places, residential buildings, retirement homes), the assumed background $CO_2$ level reference is simply not applicable. The true internal reference measurement of Vaisala CARBOCAP® $CO_2$ transmitters provides years of stable $CO_2$ measurements.

The GMM112 Carbon Dioxide Module is designed especially for DCV (Demand Controlled Ventilation) applications with three optional $CO_2$ measurement ranges of 0…2000 ppm, 0…5000 ppm and 0…10000 ppm.



# Technical data

## Performance

| | |
|---|---|
| $CO_2$-measurement range | 0 ...2000 ppm<br>0 ...5000 ppm<br>0 ... 10000 ppm |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) | ± (2 % of range + 2 % of reading |
| Long-term stability | ± 5 % of range/5 years |
| Response time T90 | 1 min |
| Temperature dependence, typical | -0,35 % of reading / °C |
| Pressure dependence, typical | +0,15 % of reading/hPa |
| Warm-up time | 1 min, 10 min for full. specification |
| Product lifetime | > 10 years |

## Operating environment

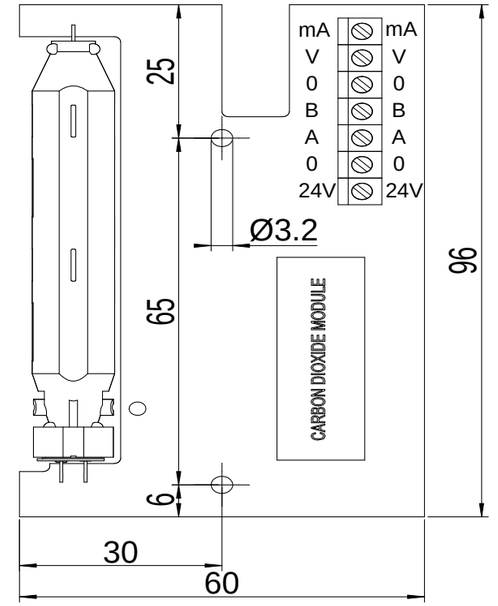
| | |
|---|---|
| Temperature | -5 ...+45 °C (23 ... 113 °F) |
| Humidity | 0 ...85 %RH |
| Pressure | 700 ... 1200 hPa |
| Electromagnectic compatibility | |
| Complies with EMS standard EN61326-1:1997 + Am1:1998, Generic Environment | |

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 24 V (±20 %) AC/DC |
| Power consumption | <2 W |
| Outputs | 4 … 20 mA, 0 … 10 V, RS-485, 2-wire, non-isolated |

## Dimensions

Dimensions in mm



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# GMM20W Carbon Dioxide Module for OEM Applications

## Features/Benefits

- Incorporates the silicon based Vaisala CARBOCAP® Sensor
- Stable in terms of time and temperature
- Dust, water vapor or most chemicals do not affect the measurement accuracy of the sensor
- Small size enables easy integration into various systems

*The Vaisala CARBOCAP® Carbon Dioxide Module GMM20W is designed for OEM applications in benign environments.*



# Technical data

## Performance

| CARBON DIOXIDE MEASUREMENT | |
|---|---|
| Measurement range | 0 ... 2000 ppm (nominal; can be calibrated for other ranges: 0 ... 5000 ppm, 0 ... 10,000 ppm, 0 ... 20,000 ppm) |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) | ± (2 % of range + 2% of reading) |
| Long-term stability | <±5 % of range / 5 years |
| Response time (63%) | 1 minute |
| Warm-up time | minute, 15 minutes full specifications |
| Weight | 45 g |

## Inputs and outputs

| | |
|---|---|
| Outputs | 0 ... 20 or 4 ... 20 mA and 0 ... 10 V |
| Resolution of analog outputs | 8 bits |
| current output | max. 500 ohm |
| voltage output | min. 1 kohm |
| Operating voltage | nominal 24 VAC/DC (18 ... 30 VDC) |
| Power consumption | <2.5 W |

## Operating environment

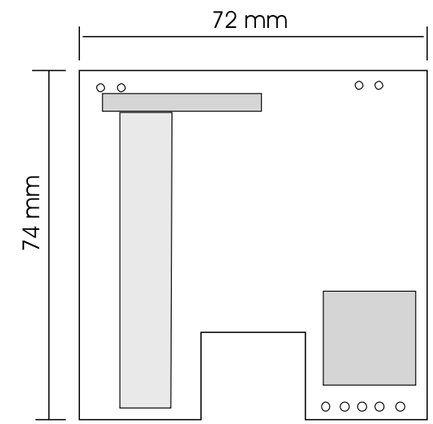
| | |
|---|---|
| Temperature | -5 ... +45 °C (+23 ... +113 °F) |
| Humidity | 0 ... 85 %RH, non-condensing |
| Electromagnetic compatibility | EN61326-1, Generic Environment |

## Accessories and options

| | |
|---|---|
| Display and relay option | GMI21 |
| Relay output option | GMR20 |
| Calibration software kit (disk and serial COM adapter) | 19222GM |
| Analog temperature module* (not available when display option is added) | GMA20T |

## Dimensions

Dimensions in mm

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# GML20 and GML20T LonWorks® Options for GMD/W20 Series

*GML20T module connects a Vaisala CARBOCAP® Carbon Dioxide Transmitter GMW21 to a LonWorks® network.*

*GML20 (left) and GML20T modules enable digital communication between the Vaisala CARBOCAP® Carbon Dioxide Transmitter Series GM20 and a LonWorks® network.*

## Significant savings

Vaisala's GML20 and GML20T are interface modules for distributing signals from Vaisala CARBOCAP® Carbon Dioxide Transmitter Series GM20 digitally to a LonWorks® network over a twisted pair.

**Features/Benefits**

- Enables digital communication between Vaisala CARBOCAP®
- Carbon Dioxide Transmitter Series GM20 and LonWorks®
- GML20 for $CO_2$ signal
- GML20T for $CO_2$ + T signal
- Savings in cabling, installation and maintenance costs

The GML20 Module distributes $CO_2$ signals; the GML20T Module distributes both $CO_2$ and temperature signals. The GML20T Module can be used only with the Vaisala CARBOCAP® Carbon Dioxide Transmitter GMW21.

The use of these modules and Vaisala CARBOCAP® Carbon Dioxide Transmitter Series GM20 with a LonWorks® networked control system contributes to considerable savings in cabling, installation and maintenance costs.

## Intelligent LonTalk® protocol

In a LonWorks® network, devices called nodes communicate with each other using the LonTalk® protocol. Every node consists of a Neuron® chip and a transceiver. The Neuron® chip is a microprocessor which contains an application program and LonTalk® protocol. The transceiver adapts the Neuron® chip into the hardware environment used. The nodes communicate with each other, sending messages containing the value of the desired variables.

With Vaisala modules, these variables are $CO_2$ (GML20) or $CO_2$ and temperature (GML20T). Some network variables are so-called configuration variables, which are used to define the behavior of the node. With the GML20 and GML20T, they are used to designate how much the temperature and/or carbon dioxide level must change before a measured value is sent again.



# Technical data

## Features

- LonWorks® interoperable
- Twisted pair free topology, network type TP/FT-10 at 78kbps
- Additional two wires needed for powering the transmitter; can thus be connected to both powered and non-powered networks
- Service button and service LED for simple installation and configuration
- External interface (.xif) file available on request (GML20 part no. 19412GM, GML20T part no. 19748GM)
- Temperature (GML20T only): Measurement accuracy 0.5 °C (0.9 °F) Measurement range 0 ... +45 °C (+32 ... 113 °F) Warm-up time 30 min.

## Network Variables for $CO_2$

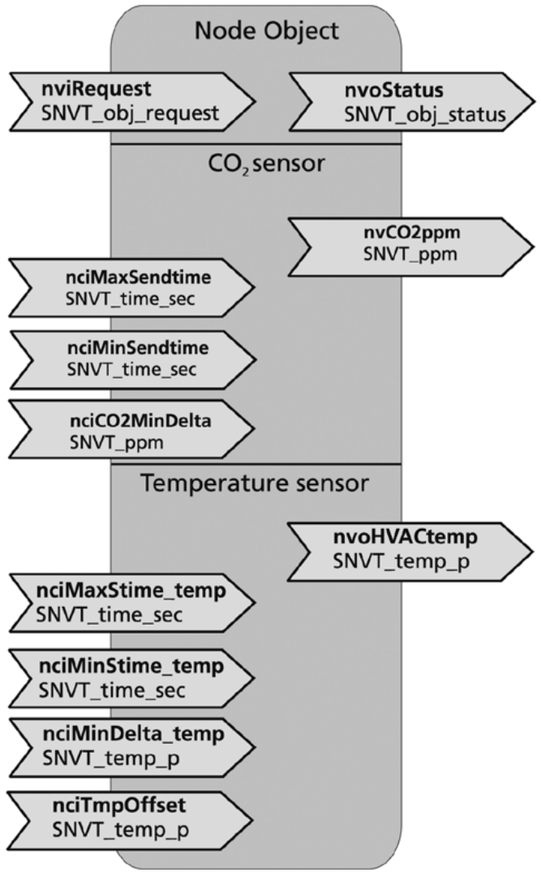
(BOTH MODELS GML20 AND GML20T)

**nviRequest:** to request modes for objects within this node
**nvoStatus:** to report status of objects on this node
**nvo$CO_2$ppm:** this output variable reports the $CO_2$ level detected by the sensor
**nciMaxSendtime:** indicates the maximum period of time that expires before the sensor object automatically updates all its output variables (default value: 300 seconds)
**nciMinSendtime:** indicates the minimum period between output network variable transitions (default value: 5 seconds)
**nci$CO_2$MinDelta:** indicates the minimum $CO_2$ level change required to update the output network variables (default value: 10 ppm)

## Networks Variables for Temperature

(GML20T MODEL ONLY)

**nvoHVACtemp:** this output variable reports the temperature detected by the sensor
**nciMaxStime_temp:** indicates the maximum period of time that expires before the sensor object automatically updates all its output variables (default value: 300 seconds)
**nciMinStime_temp:** indicates the minimum period between output network variable transitions (default value: 5 seconds)
**nciMinDelta_temp:** indicates the minimum temperature change required to update the output network variables (default value: 0.3 °C)
**nciTmpOffset:** indicates the temperature offset level (default value: -0.8 °C)

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# OMT355 Oxygen Transmitter for Industrial Process Measurements

*The Vaisala SPECTRACAP® Oxygen Transmitter.*

*OMT355 with the sampling cell.*

## Features/Benefits

- Minimizes need for sample conditioning equipment
- In-situ probe or sampling cell options
- Tolerates aggressive chemicals
- Tolerates excessive amounts of moisture even in liquid form
- Low maintenance
- Diagnostic output for preventive maintenance
- Heated optical surfaces to prevent condensation
- Typical applications:
  - gas generation
  - gas blanketing
  - fermentation
  - composting process monitoring

The Vaisala SPECTRACAP® Oxygen Transmitter OMT355 is ideal for oxygen monitoring in moist and aggressive process gases. Typical applications include gas generation, inert gas blanketing, fermentation and composting process monitoring.

## Laser based measurement

The Vaisala SPECTRACAP® Oxygen Transmitter OMT355 is ideal for oxygen monitoring in moist and aggressive process gases.The OMT355 incorporates a compact tunable diode laser (TDL) gas spectrometer built in the measurement probe. This optical measurement technology is well known for unmatched stability and robustness. The SPECTRACAP® sensor offers TDL technology in a compact probe suitable for field use.

## Direct installation

In many applications, the OMT355 can be flange-mounted directly into a process. No sampling or sample conditioning equipment is needed. This feature provides real time measurement data without sampling or sample switching delays.

## Sampling cell installation

An optional sampling cell is available for processes with high temperatures, elevated pressures or extremely difficult mechanical conditions. Due to the robustness of the SPECTRACAP® sensor and its low sensitivity to gas flow and pressure variations, the sampling system can be very simple and it can be installed near the sampling point.

## Low maintenance

A stainless steel mesh filter and an optional porous PTFE filter protect the OMT355 probe optics from dust and dirt. An intelligent measurement algorithm further minimizes contamination effects and provides a maintenance alert well before the measurement performance is affected.

## Long calibration interval

Calibration or field checking of the instrument can be done either with ambient air or with zero/span gases injected through an optional calibration gas connector. The calibration interval of the OMT355 is 12 months.

## User friendly interfaces

For calibration and configuration, the OMT355 features both software and keypad user interfaces and an LCD display.

## TDL Technology

The Tunable Diode Laser (TDL) technology used in the SPECTRACAP® sensor is one of the most powerful technologies in gas measurement on the market today.

The technology is based on measuring the attenuation of a beam of laser light in the sample gas. For oxygen sensing the laser is tuned to a wavelength which is characteristic and unique for the oxygen molecule. Therefore, the measured attenuation is an extremely selective measure for the amount of oxygen on the path of the laser beam.

# Technical data

### Performance

| | |
|---|---|
| Measurement range | 0 ... 100 % $O_2$ |
| Accuracy (including noise, linearity, and repeatability) | ±0.2 % $O_2$ |
| Temperature dependence over T range | ±2 % of reading |
| Stability | ±1 % of reading/yr |
| Zero drift | ±0.1 % $O_2$/yr |
| Response time of measurement | 3 s |
| Diffusion limited response in still air | $T_{63}$/$T_{90}$ |
| without filters | 10 s / 20 s |
| with stainless steel mesh filter | 10 s / 25 s |
| with stainless steel mesh and PTFE filters | 30 s / 70 s |
| Pressure dependence without pressure compensation | |
| 0.8 ... 1.2 bar | -2 % of reading |
| 1.2 ... 1.4 bar | -5 % of reading |
| Accuracy of pressure compensation | ±0.25 % of reading |
| Background gas effects for $CO_2$ and $H_2O$, uncompensated | <1 % of reading for <6 vol-% $CO_2$<br><1 % of reading for gas dewpoint < 30 °C |
| Accuracy of background gas compensation | |
| 0 ... 50 vol-% $CO_2$ | ±0.5 % of reading |
| 0 ... 300 g/m³ $H_2O$ ($T_d$ = 80 °C) | ±1 % of reading |

### Operating Environment

| | |
|---|---|
| Operating temperature range | |
| for probe (in-line installation) | -20 ... +80 °C |
| for electronics (housing) | -40 ... +60 °C |
| for transmitter (ambient gas measurement) | -20 ... +60 °C |
| Storage temperature range | -55 ... +80 °C |
| Operating pressure range | 0.8 ... 1.4 bar |
| Maximum pressure range for probe | up to 10 bar |
| Compliance | |
| IEC(EN)-61326 Electrical equipment for measurement, control and laboratory use. EMC requirements | |
| EN50104 Electrical apparatus for the detection and measurement of oxygen. Performance requirements and test methods. | |
| EN50271 Electrical Apparatus for the Detection and Measurement of Combustible Gases, Toxic Gases or Oxygen | |
| Laser safety | Class 1 laser product |

### Inputs and Outputs

| | |
|---|---|
| Power supply | |
| input range | 11 ... 36 VDC |
| Power consumption | |
| maximum | 6 W |
| typical | 3 W |
| Analog output | 0/4 ... 20 mA, sourcing |
| maximum load | 500 Ω |
| Serial output (2-wire, non-isolated) | RS-485 |
| Alarm/control relay | 30 VAC/60 VDC |

# Technical data

## Mechanics

| | |
|---|---|
| Housing material | G-AlSi10 Mg (DIN 1725) |
| Probe material | AISI 316 |
| Housing classification | IP66 |
| Dimensions | 306 mm x 184 mm x 74 mm |
| Weight | 2.2 kg |
| Mounting flange diameter | 97 mm |
| Can be fitted to standard flanges. Minimum sizes: DIN (2527B) DN50 and ANSI (150) 2.5" | |
| Cable bushing | Cable gland M20 x 1.5 |
| Stainless steel mesh filter | openings ø 310 µm |
| Wetted materials | |
| AISI 316, EPDM or Kalrez® (optional), PTFE (optional), SiN, $MgF_2$ | |

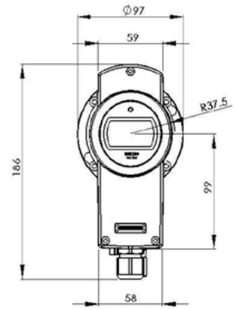
## Options and accessories

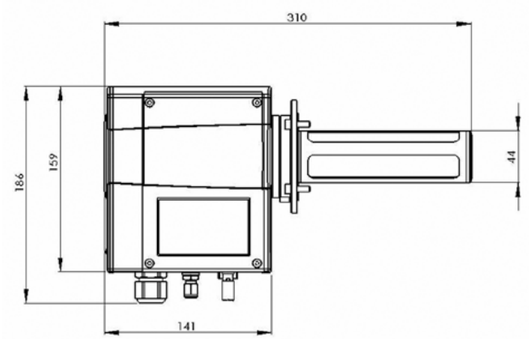
| | |
|---|---|
| Hydrophobic PTFE filter, pore size 8 µm | |
| with EPDM O-rings | 217055 |
| with Kalrez® O-rings | 217056 |
| 1/2" NPT conduit fitting | 217197 |
| M12 male 8-pin connector for user cable | 214806SP |
| Serial interface cable for PC | 19446ZZ |
| USB-RJ45 Serial interface cable | 219685 |
| Sample cell with wall mounting bracket | |
| with EPDM O-rings | 217052 |
| with Kalrez® O-rings | 216619 |

*For complete specifications, refer to the User's Guide.*

## Dimensions

| | |
|---|---|
| Dimensions in mm | 306 mm x 184 mm x 74 mm |

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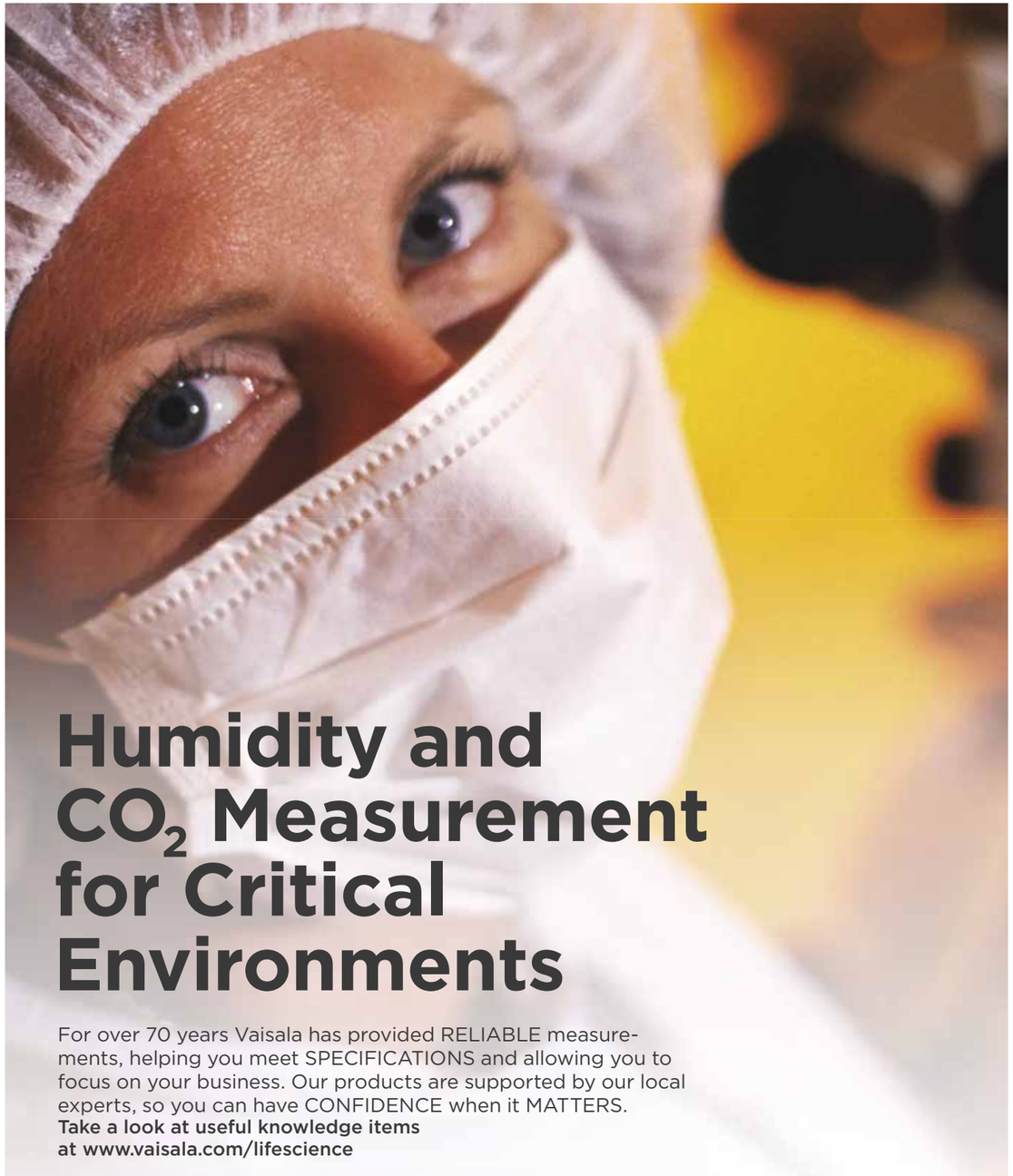
Humidity and
$CO_2$ Measurement
for Critical
Environments
For over 70 years Vaisala has provided RELIABLE measurements, helping you meet SPECIFICATIONS and allowing you to focus on your business. Our products are supported by our local experts, so you can have CONFIDENCE when it MATTERS.
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# OMT364 Oxygen Transmitter for Hazardous Areas

*The Vaisala SPECTRACAP® Oxygen Transmitter OMT364 for hazardous areas.*

## Features/Benefits

- Minimizes need for sample conditioning equipment
- In-situ probe or sampling cell
- Tolerates aggressive chemicals
- Tolerates excessive amounts of moisture even in liquid form
- Low maintenance
- Calibration interval 12 months
- Software and keypad user interfaces and an LCD display
- Example applications: fermentation, composting process monitoring, inerting processes and flare gas recovery

The Vaisala SPECTRACAP® Oxygen Transmitter OMT364 is designed for oxygen monitoring in moist and aggressive process gases.

## Laser based measurement

The OMT364 incorporates a compact tunable diode laser (TDL) gas spectrometer built in the measurement probe. This optical measurement technology is well known for unmatched stability and robustness. The patented SPECTRACAP® sensor offers uniquely TDL technology in a compact probe suitable for field use.

## FM Approved OMT364 for Hazardous Areas

The non-incendive OMT364 transmitter is permitted for use in Class I, Division 2 of the NEC® 500 area classification according to FM Approvals SM . The probe of the instrument can be installed in areas that are classified as Class I, Division 1 or 2.

## Direct installation

In many applications, the OMT364 can be flange-mounted directly into a process. No sampling or sample conditioning equipment is needed. This feature provides real time measurement data without sampling or sample switching delays.

## Sampling cell installation

An optional sampling cell is available for processes with high temperatures, elevated pressures or extremely difficult mechanical conditions. Due to the robustness of the SPECTRACAP® sensor and its low sensitivity to gas flow and pressure variations, the sampling system is simple and it can be installed near the sampling point.



# Technical data

## Performance

| | |
|---|---|
| Measurement range | 0 ... 100 % $O_2$ |
| Accuracy (including noise, linearity and repeatability) | ±0.2 % $O_2$ |
| Temperature range over T range | ±2 % of reading |
| Stability | ±1 % of reading/yr |
| Zero drift | ±0.1 % $O_2$/yr |
| Response time of measurement | 3 s |
| Diffusion limited response in still air | $T_{63}$/$T_{90}$ |
| without filters | 10 s / 20 s |
| with stainless steel mesh filter | 10 s / 25 s |
| with stainless steel mesh filter and PTFE filters | 30 s / 70 s |
| Pressure dependence without pressure compensation | |
| 0.8 ... 1.2 bar | -2 % of reading |
| 1.2 ... 1.4 bar | -5 % of reading |
| Accuracy of pressure compensation | ±0.25 % of reading |
| Background gas effects for $CO_2$ and $H_2O$ uncompensated | |
| | < 1% of reading for <6 vol -% $CO_2$ |
| | < 1% of reading for gas dew point < 30 °C |
| Accuracy of background gas compensation | |
| 0 ... 50 vol-% $CO_2$ | ±0.5 % of reading |
| 0 ... 300 g/m³ $H_2O$ ($T_d$=80 °C) | ±1 % of reading |

## Operating environment

| | |
|---|---|
| Operating temperature range for | |
| probe (in-line installation) | -20 ... +80 °C |
| electronics (housing) (Kalrez® seals) | -20 ... +60 °C |
| transmitter (ambient gas measurement) | -20 ... +60 °C |
| Storage temperature range | -55 ... +80 °C |
| Operating pressure range | 0.8 ... 1.4 bar |
| Maximum pressure range for probe | up to 10 bar |
| Compliance | |
| IEC(EN)-61326 Electrical equipment for measurement, control and laboratory use. EMC requirements. | |
| Laser safety | Class 1 laser product |

## Classification

| | |
|---|---|
| OMT364 CLASSIFICATIONS FOR THE TRANSMITTER | |
| USA and Canada | FM, Non-incendive for Class I, Division 2, Groups A, B, C, and D. $T_a$ = -20 °C to +60 °C |
| OMT364 CLASSIFICATIONS FOR THE PROBE | |
| USA and Canada | FM, Suitable for Class I, Division 1, Groups A, B, C, and D. $T_a$ = -20 °C to +80 °C |

## Inputs and outputs

| | |
|---|---|
| Power supply | |
| input range | 11 ... 36 VDC |
| Power consumption | |
| maximum | 6W |
| typical | 3W |
| Analog output | 0/4 ... 20 mA sourcing |
| maximum load | 500 Ω |
| Serial output (2-wire, non-isolated) | RS-485 |
| Alarm/control relay | 30 VAC/60 VDC |

## Mechanics

| | |
|---|---|
| Housing material | G-AlSi10 Mg (DIN 1725) |
| Probe material | AISI 316 |
| Housing classification | IP66 |
| Weight, transmitter and probe | 2.2 kg |
| Weight, sample cell | 2.6 kg |
| Mounting flance diameter | 97 mm |
| Cable bushing | Cable gland M20 x 1.5 |
| Stainless steel mesh filter | openings ø 310 µm |
| Wetted materials | |
| AISI 316, Kalrez®, PTFE (optional), SiN, $MgF_2$ | |

## Options and accessories

| | |
|---|---|
| Hydrophobic PTFE filter, pore size 8 µm with Kalrez® O-rings | 217056 |
| 1/2" NPT conduit fitting | 217917 |
| Sample cell with wall-mounting bracket | |
| gas fittings for O.D. 6 mm tube | |
| volume 260 m³ | |
| T63 response time with 1 l/min sample flow and mesh filter, 18 s with Kalrez® O-rings | 216619 |

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For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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# PTU300 Combined Pressure, Humidity and Temperature Transmitter for demanding applications

*The Vaisala PTU300 Combined Pressure, Humidity and Temperature Transmitter is a versatile, multi-purpose instrument.*

## Features/Benefits

- Barometric pressure, humidity and temperature measurement in one transmitter
- Available with two barometric pressure sensors – added reliability
- RS-232C serial interface with NMEA protocol for GPS use
- Optional display, RS-485, analog output, and relay
- Optional power supply module
- NIST traceable calibration
- HMT330MIK Installation kit for outdoor use
- Applications include environmental monitoring in calibration laboratories, GPS meteorology: estimating precipitable water vapor in the atmosphere; weather stations

## One transmitter, three measurements

The Vaisala Combined Pressure, Humidity and Temperature Transmitter PTU300 measures barometric pressure in two accuracy classes, humidity, and temperature.

You can choose which probe best suits your needs: PTU301 for laboratories, PTU303 for outdoor use, the warmed PTU307 probe for demanding meteorology, and PTU30T for pressure and temperature only.

## Vaisala proven sensor technology

The PTU300 transmitter uses sensors known for their high accuracy and excellent long-term stability: the Vaisala BAROCAP® is used for pressure measurement and the Vaisala HUMICAP® for humidity measurement. The temperature sensor is a platinum RTD sensor.

## Graphical trend display

The PTU300 series features a large numerical and graphical display, allowing users to easily monitor operational data, measurement trends and 1-year measurement history. The optional data logger with real-time clock makes it possible to generate over four years of measured history, and zoom in on any desired time or time frame. The battery backup of the real-time clock guarantees a reliable logging of measured data.

The display alarm allows tracking of any measured parameter, with a freely configurable low and high limit.

## Data collection and (wireless) transfer to PC

The recorded measurement data can be viewed on the display or transferred to a PC with Microsoft Windows® software. The transmitter can also be connected to a network with an optional (W)LAN interface, which enables a (wireless) Ethernet connection.

A USB-RJ45 cable makes it easy to connect the service port of the PTU300 to a PC.

## Flexible calibration

A quick, one-point field calibration for humidity can easily be done using the Vaisala Hand-Held Humidity Meter HM70.

## Serial communication

The PTU300 comes with a standard RS-232 serial interface. The output format is compatible with major GPS receivers and NMEA coded messages. RS-485 is available as an option.

## Outdoor installation kit

The optional HMT330MIK Installation Kit is available for outdoor installation. It provides reliable measurements for meteorological purposes.

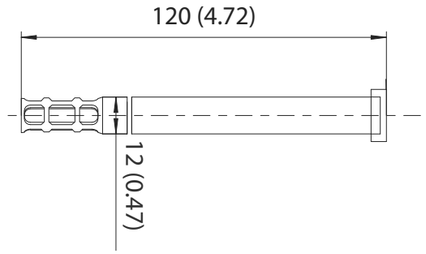


# PTU300 Models

*PTU301 for wall mounting*

**Dimensions**

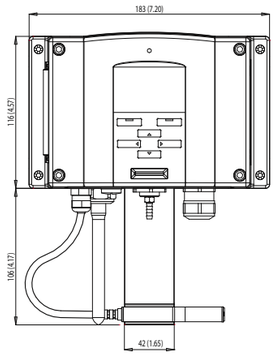
Dimensions in mm (inches)



*PTU301 short cable probe*

**Dimensions**

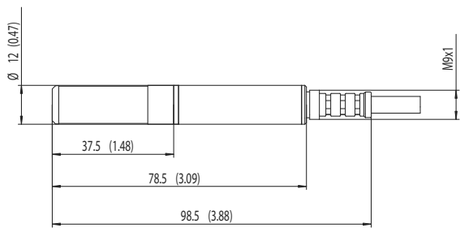
Dimensions in mm (inches)



*PTU303 for outdoor use*

**Dimensions**

Dimensions in mm (inches)

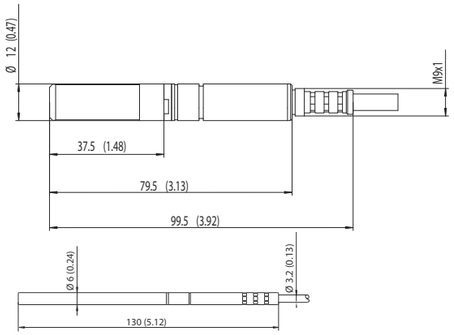


# PTU300 Models

*PTU307 warmed probe for demanding meteorological installations*

## Dimensions

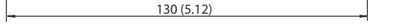
Dimensions in mm (inches)



*PTU30T for pressure and temperature only measurement*

## Dimensions

Dimensions in mm (inches)






# Technical data

## Performance

BAROMETRIC PRESSURE

| | | | |
|---|---|---|---|
| Pressure range | | 500 ... 1100 hPa, 50 ... 1100 hPa | |
| Accuracy | 500 ... 1100 hPa | 500 ... 1100 hPa | 50 ... 1100 hPa |
| | CLASS A | CLASS B | |
| Linearity | ±0.05 hPa | ±0.10 hPa | ±0.20 hPa |
| Hysteresis* | ±0.03 hPa | ±0.03 hPa | ±0.08 hPa |
| Repeatability* | ±0.03 hPa | ±0.03 hPa | ±0.08 hPa |
| Calibration uncertainty** | ±0.07 hPa | ±0.15 hPa | ±0.20 hPa |
| Accuracy at +20 °C*** | ±0.10 hPa | ±0.20 hPa | ±0.30 hPa |
| Temperature dependence**** | ±0.1 hPa | ±0.1 hPa | ±0.3 hPa |
| Total accuracy (-40 ... +60 °C/ -40 ... +140 °F) | ±0.15 hPa | ±0.25 hPa | ±0.45 hPa |
| Long-term stability/year | ±0.1 hPa | ±0.1 hPa | ±0.2 hPa |
| Response time (100 % response) | | | |
| one sensor | 2 s· | 1 s· | 1 s· |
| Pressure units | hPa, mbar, kPa, Pa, inHg, mmH20, mmHg, torr, psia | | |

* Defined as ±2 standard deviation limits of endpoint non-linearity, hysteresis error or repeatability error and calibration.

** Defined as ±2 standard deviation limits of accuracy of the working standard including traceability to NIST.

*** Defined as the root sum of the squares (RSS) of endpoint non-linearity, hysteresis error, repeatability error and calibration uncertainty at room temperature.

**** Defined as ±2 standard deviation limits of temperature dependence over the operating temperature range.

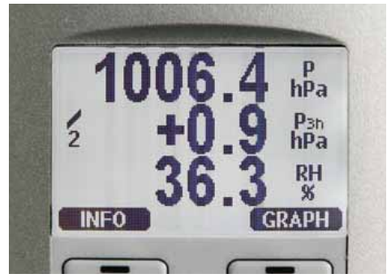
RELATIVE HUMIDITY

| | |
|---|---|
| Measurement range | 0 ... 100 %RH |
| Accuracy (including non-linearity, hysteresis, and repeatability at +15 ... +25 °C | ±1 %RH (0 ... 90 %RH) |
| | ±1.7 %RH (90 ... 100 %RH) |
| at -20 ... +40 °C | ±(1.0 + 0.008 x reading) %RH |
| at -40 ... +60 °C | ±(1.5 + 0.015 x reading) %RH |
| Factory calibration uncertainty (+20 °C ) | |
| (Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.) | ± 0.6 %RH (0 ... 40 %RH) |
| | ± 1.0 %RH (40 ... 97 %RH) |
| Sensor | |
| for typical applications | Vaisala HUMICAP® 180 or 180R* |
| for applications with chemical purge/warmed probe | Vaisala HUMICAP® 180C or 180RC* |
| Response time (90 %) at +20 °C (+68 °F) in still air | |
| with grid filter | 8 s / 17 s* |
| with grid + steel netting filter | 20 s / 50 s* |
| with sintered filter | 40 s / 60 s* |

* with HUMICAP® 180R or 180RC sensor

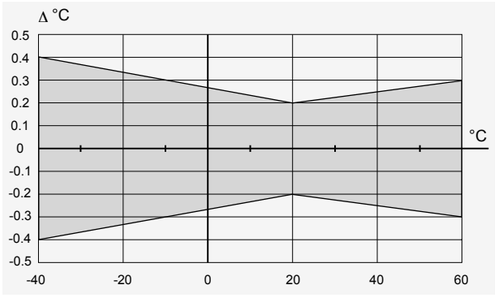
TEMPERATURE

| | |
|---|---|
| Measurement range, all probes | -40 ... +60 °C (-40 ... +140 °F) |
| Accuracy at +20 °C (+68 °F) | ± 0.2 °C (± 0.4 °F) |
| Temperature units | °C, °F |




*The display also shows the WMO pressure trend ΔP 3h and tendency of 0 ... 9.*

ACCURACY OVER TEMPERATURE RANGE




| | |
|---|---|
| Temperature sensor | PT100 RTD 1/3 Class B IEC 751 |

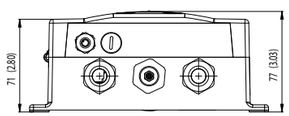
## Operating Environment

| | |
|---|---|
| Operating temperature | -40 ... +60 °C (-40 ... +140 °F) |
| with display | 0 ... +60 °C (+32 ... +140 °F) |
| Humidity range | non-condensing |
| Electromagnetic compatibility | EN61326-1:1997 + Am1:1998 +Am2:2001; Industrial Environment |

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 10 ... 35 VDC, 24 VAC |
| with optional power supply module | 100 ... 240 VAC, 50/60 Hz |
| Power consumption at +20 °C ($U_{in}$ 24 VDC) | |
| RS-232 | max. 28 mA |
| $U_{out}$ 3 x 0 ... 1 V/0 ... 5 V/0 ... 10 V | max. 33 mA |
| $I_{out}$ 3 x 0 ... 20 mA | max. 63 mA |
| display and backlight | +20 mA |
| during chemical purge | max. +110 mA |
| during probe heating | +120 mA |
| Settling time at power-up (one sensor) | |
| class A | 4 s |
| class B | 3 s |
| External loads | |
| current outputs | $R_L$ < 500 ohm |
| 0 ... 1 V output | $R_L$ > 2 kohm |
| 0 ... 5 V and 0 ... 10 V outputs | $R_L$ > 10 kohm |

| | | |
|---|---|---|
| Recommended wire size | 0.5 mm² (AWG 20) stranded wires | |
| Digital outputs | RS-232, RS-485 (optional) | |
| Service connection | RS-232, USB | |
| Relay outputs (optional) | 0.5 A, 250 VAC | |
| Ethernet interface (optional) | | |
| Supported standards | 10/100Base-T | |
| Connector | RJ45 | |
| Protocols | Telnet | |
| Software support | Vaisala MI70 link | |
| WLAN interface (optional) | | |
| Supported standards | 802.11b | |
| Antenna connector type | RP-SMA | |
| Protocols | Telnet | |
| Security | WEP 64/128, WPA | |
| Software support | Vaisala MI70 link | |
| Authentication / Encryption (WLAN) | | |
| Open / no encryption | | |
| Open / WEP | | |
| WPA Pre shared key / TKIP | | |
| WPA Pre shared key / CCMP (a.k.a. WPA2) | | |
| Optional data logger with real-time clock | | |
| Logged parameters | max. three with trend/min/max values | |
| Logging interval | 10 sec (fixed) | |
| Max. logging period | 4 years 5 months | |
| Logged points | 13.7 million points per parameter | |
| Battery lifetime | min. 5 years | |
| Display | LCD with backlight, graphic trend display of any parameter | |
| Menu languages | English, Finnish, French, German, Japanese, Chinese, Spanish, Swedish, Russian | |
| Analog outputs (optional) | | |
| current output | 0 ... 20 mA, 4 ... 20 mA | |
| voltage output | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V | |
| Humidity and temperature | | |
| accuracy at +20 °C | ±0.05% full scale | |
| temperature dependence | ±0.005%/°C full scale | |
| Pressure | 500 ... 1100 hPa | 50 ... 1100 hPa |
| accuracy at +20 °C | ±0.30 hPa | ±0.40 hPa |
| accuracy at -40 ... +60 °C | ±0.60 hPa | ±0.75 hPa |




## Mechanics

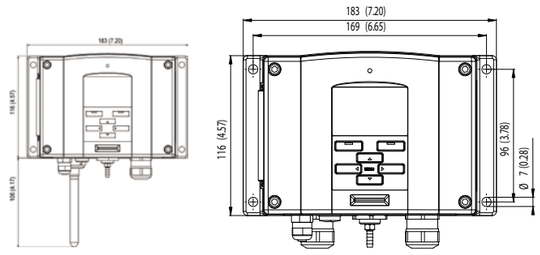
| | |
|---|---|
| Cable bushing | M20 x 1.5 for cable diameter 8 ... 11 mm/0.31 ... 0.43" |
| Conduit fitting | 1/2" NPT |
| User cable connector (optional) | M12 series 8-pin (male) |
| option 1 | female plug with 5 m (16.4 ft) black cable |
| option 2 | female plug with screw terminals |
| Probe cable diameter | |
| PTU303 | 6.0 mm |
| other probes | 5.5 mm |
| Housing material | G-AlSi 10 Mg (DIN 1725) |
| Housing classification | IP 65 (NEMA 4) |
| Weight | |
| depending on selected probe | 1.5 ... 2.0 Kg |

## Accessories

| | |
|---|---|
| PC software and cable | 215005 |
| USB-RJ45 Serial Connection Cable | 219685 |
| Connection cable for HM70 | 211339 |
| Wall mounting plate (plastic) | 214829 |
| Pole installation kit | 215108 |
| Rain shield | 215109 |
| DIN rail installation set | 211477 |
| Duct installation kit, PTU303/307 | 210697 |
| Cable gland and AGRO, PTU303/307 | HMP247CG |
| Solar radiation shield, PTU303/307/30T | DTR502B |
| Meteorological installation kit | HMT330MIK |
| Duct installation kit (T probe) | 215003 |

## Dimensions

Dimensions in mm (inches)

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TYPE APPROVED PRODUCT
CERTIFICATE NO.: A-11440

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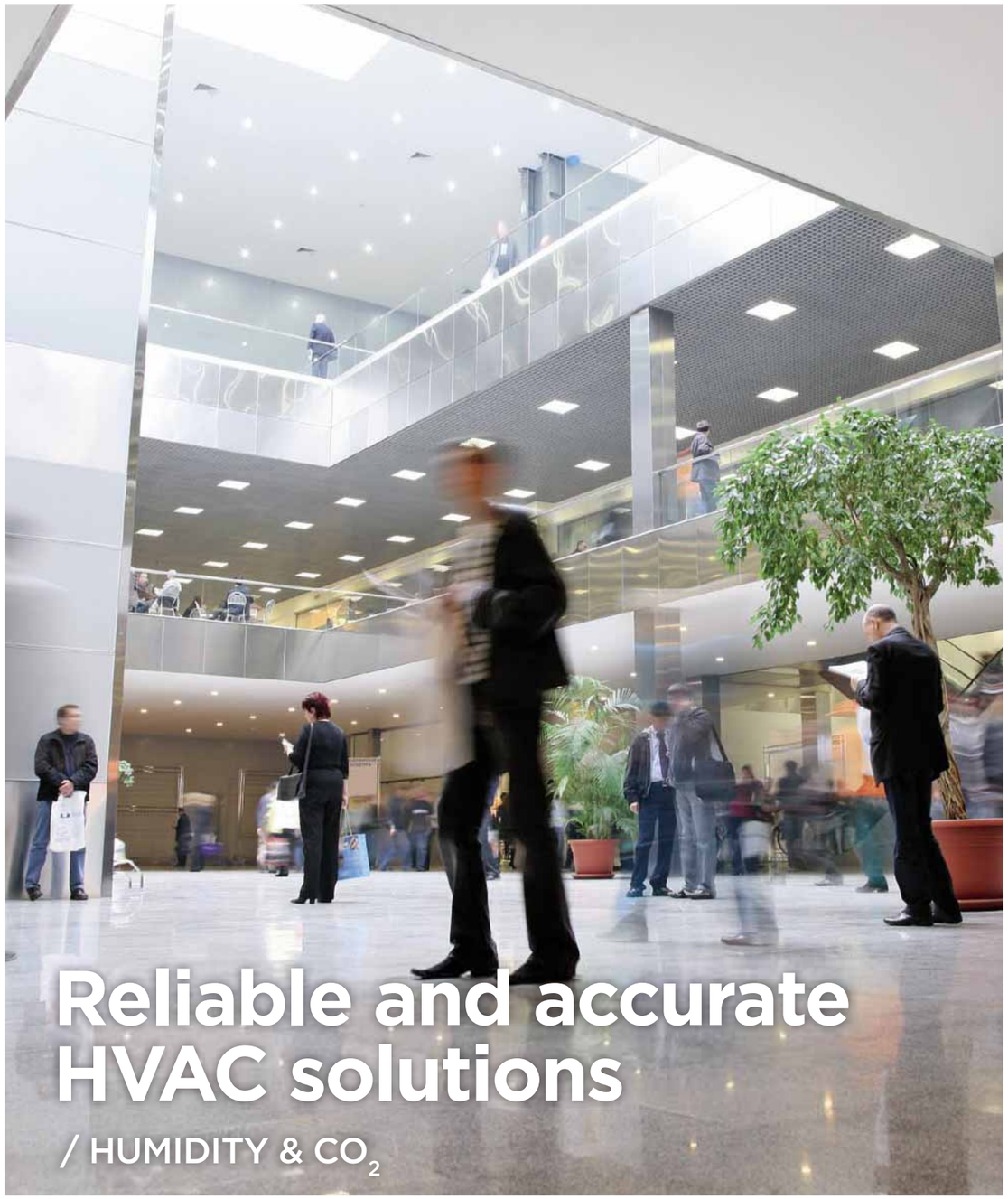


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# PTB330 Digital Barometer for Professional Meteorology, Aviation, and Industrial Users

*Vaisala BAROCAP® Digital Barometer PTB330 with a new trend display.*

Vaisala BAROCAP® Digital Barometer PTB330 is a new generation barometer, designed for a wide range of high-end atmospheric pressure measurement. The pressure measurement of the PTB330 is based on the Vaisala in-house, silicon capacitive, absolute pressure sensor - the Vaisala BAROCAP® Sensor. It provides high measurement accuracy and excellent long-term stability.

## Features/Benefits

- Vaisala BAROCAP® sensor
- Accurate measurement
- Excellent long-term stability
- Added reliability through redundancy
- Graphical trend display with 1-year history data
- Height and altitude corrected pressure (QFE, QNH)
- For professional meteorology and aviation, laboratories, demanding industrial applications

## Highly accurate

The PTB330 series is highly accurate. The Class A barometers for the most demanding applications are fine-tuned and calibrated against a high-precision pressure calibrator. Class B barometers are adjusted and calibrated using electronic working standard. All the PTB330 barometers come with a NIST traceable, factory calibration certificate.

## Reliability through redundancy

According to customers' choice, the PTB330 can incorporate one, two or three BAROCAP® sensors. When two or three sensors are used, the barometer continuously compares the readings of the pressure sensors against one another and provides information on whether these are within the set internal difference criteria. This unique feature provides redundancy in pressure measurement.

Thus, users also get a stable and reliable pressure reading at all times as well as a pre-indication of when to service or recalibrate the barometer.

## QNH and QFE

The PTB330 can be set to compensate for QNH and QFE pressure used especially in aviation. The QNH represents the pressure reduced to sea level, based on the altitude and temperature of the observation site. The QFE represents the height corrected pressure of small differences in altitude, for example, the air pressure at the airfield elevation.

## Graphical display

The PTB330 features a multi-lingual, graphical display allowing users to monitor measurement trends. The graph is updated automatically while measuring and it provides a one-year measurement history. In addition to instant pressure, the PTB330 also provides the WMO pressure trend and tendency codes.

## Applications

The PTB330 can be used successfully for aviation, professional meteorology, and for demanding industrial pressure measurement applications such as accurate laser interferometric measurement and exhaust gas analysis in engine test benches.



# Technical data

## Performance

| BAROMETRIC PRESSURE RANGE 500 ... 1100 hPa | Class A | Class B |
|---|---|---|
| Linearity* | ±0.05 hPa | ±0.10 hPa |
| Hysteresis* | ±0.03 hPa | ±0.03 hPa |
| Repeatability* | ±0.03 hPa | ±0.03 hPa |
| Calibration uncertainty** | ±0.07 hPa | ±0.15 hPa |
| Accuracy at +20 °C (+68 °F) *** | ±0.10 hPa | ±0.20 hPa |

| BAROMETRIC PRESSURE RANGE 50 ... 1100 hPa | Class B |
|---|---|
| Linearity* | ±0.20 hPa |
| Hysteresis* | ±0.08 hPa |
| Repeatability* | ±0.08 hPa |
| Calibration uncertainty** | ±0.15 hPa |
| Accuracy at +20 °C *** | ±0.20 hPa |
| TEMPERATURE DEPENDENCE**** | |
| 500 ... 1100 hPa | ±0.1 hPa |
| 50 ... 1100 hPa | ±0.3 hPa |

| TOTAL ACCURACY -40 ... +60 °C (-40 ... +140 °F) | Class A | Class B |
|---|---|---|
| 500 ... 1100 hPa | ±0.15 hPa | ±0.25 hPa |
| 50 ... 1100 hPa | | ±0.45 hPa |
| LONG-TERM STABILITY | | |
| 500 ... 1100 hPa | | ±0.1 hPa/year |
| 50 ... 1100 hPa | | ±0.1 hPa/year |

* Defined as ±2 standard deviation limits of endpoint non-linearity, hysteresis or repeatability error.
** Defined as ±2 standard deviation limits of inaccuracy of the working standard including traceability to NIST.
*** Defined as the root sum of the squares (RSS) of endpoint non-linearity, hysteresis error, repeatability error and calibration uncertainty at room temperature.
**** Defined as ±2 standard deviation limits of temperature dependence over the operating temperature range.

## Operating environment

| | |
|---|---|
| Pressure range | 500 ... 1100 hPa, 50 ... 1100 hPa |
| Temperature range | |
| operating | -40 ... +60 °C (-40 ... +140 °F) |
| with local display | 0 ... +60 °C (+32 ... +140 °F) |

## Data transfer software

| | |
|---|---|
| MI70 Link Interface Software | |
| Requirement: | Microsoft® Windows OS |
| | Microsoft® Excel |

## Inputs and outputs

| | | |
|---|---|---|
| Supply voltage | | 10 ... 35 VDC |
| Supply voltage sensitivity | | negligible |
| Typical power consumption at +20 °C | | |
| ($U_{in}$ 24 VDC, one pressure sensor) | | |
| RS-232 | | 25 mA |
| RS-485 | | 40 mA |
| $U_{out}$ | | 25 mA |
| $I_{out}$ | | 40 mA |
| display and backlight | | +20 mA |
| Serial I/O | | RS232C, RS485/422 |
| Pressure units | hPa, mbar, kPa, Pa inHg, $mmH_20$, mmHg, torr, psia | |
| | Class A | Class B |
| Resolution | 0.01 hPa | 0.1 hPa |
| Settling time at power-up (one sensor) | 4 s | 3 s |
| Response time (one sensor) | 2 s | 1 s |
| Acceleration sensitivity | | negligible |
| Pressure connector | | M5 (10-32) internal thread |
| Pressure fitting | | barbed fitting for 1/8" I.D. tubing or quick connector with shutoff valve for 1/8" hose |
| Maximum pressure limit | | 5000 hPa abs. |
| Compliance | | EMC standard EN61326-1:1997 + Am1:1998 + Am2:2001: Industrial Environment |

## Mechanics

| | |
|---|---|
| Housing material | G AlSi10 Mg (DIN 1725) |
| Housing classification | IP66 |
| Weight | 1 - 1.5 kg |

## Analog output (optional)

| | | |
|---|---|---|
| Current output | 0 ... 20 mA, 4 ... 20 mA | |
| Voltage output | 0 ... 1 V, 0 ... 5 V, 0 ... 10 V | |
| Accuracy at pressure range | 500 ... 1100 hPa | 50 ... 1100 hPa |
| at +20 °C | ±0.30 hPa | ±0.40 hPa |
| at -40 ... +60 °C | ±0.60 hPa | ±0.75 hPa |

## Accessories

| | |
|---|---|
| Serial interface cable | 19446ZZ |
| USB-RJ45 serial connection cable | 219685 |
| Software interface kit | 215005 |
| Wall mounting kit | 214829 |
| Outdoor installation kit (weather shield) | 215109 |
| Installation kit for pole or pipeline | 215108 |
| Power supply module | POWER-1 |
| Temperature compensated analog output module | AOUT-1T |
| Isolated RS-485 module | RS485-1 |

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# Take the lab to the field

## Vaisala Barometric Pressure Transfer Standard PTB330TS

*Operational PTB330TS unit includes a PTB330 digital barometer, hand-held MI70 indicator, optional HMP155 humidity and temperature probe, optional MI70 Link PC software, a user's guide and a weatherproof transfer case equipped with a shoulder strap.*

*PTB330TS transport case*

Barometric Pressure Transfer Standard PTB330TS makes field inspection accurate and easy. It combines a PTB330 digital barometer with a hand-held MI70 indicator within a portable unit functioning as a transfer standard. The optional HMP155 probe is available for accurate humidity and temperature measurement.

The PTB330TS is suitable for various reference measurements in industrial and meteorological areas.

The PTB330TS comes in a durable and weatherproof transport case that can be easily carried and shipped. The components are placed in a proofing foam interior, with accessories and user's guide placed in the lid organizer. The case includes a separate inner tabletop case in which the barometer is mounted. Shoulder strap is included for convenience. Battery duration is up to 11 hours of continuous use and up to 30 days in data logging use.

### Features / Benefits

- Portable, battery operated transfer standard with data logging capability
- Barometric pressure with Vaisala BAROCAP® Digital Barometer PTB330
  - Excellent long term stability
  - Accurate measurents
  - Added reliability through redundancy
- Optional humidity and temperature measurents with HMP155
  - Vaisala HUMICAP®180R sensor - superior long-term stability
  - New, fast temperature probe
  - Chemical purge
- Multilingual user interface, nine languages
- Data can be logged, and transferred to a PC via MI70Link software
- SO/IEC 17025 Accredited calibration services available
- For professional meteorology, aviation, laboratories and demanding industrial applications

*The PTB330 Digital Barometer*

*The HMP155 probe*

*The MI70 hand-held indicator displaying the prevailing pressure in hPa*

### PTB330 Digital barometer

Vaisala BAROCAP® Digital Barometer PTB330 is a new generation barometer designed for a wide range of high-end atmospheric pressure measurement. The pressure measurement of the PTB330 is based on the Vaisala in-house, silicon capacitive, absolute pressure sensor – the Vaisala BAROCAP® Sensor. It provides high measurement accuracy and excellent long-term stability.

### High accuracy

The PTB330 series features extremely high accuracy. Class A barometers for the most demanding applications are fine-adjusted and calibrated against a high-precision pressure calibrator. All the PTB330 barometers come with a NIST traceable, factory calibration certificate, also optional ISO/IEC 17025 accreditation calibration services are available.

### Reliability through redundancy

According to customers' choice, the PTB330 can incorporate one, two or three BAROCAP® sensors. When two or three sensors are used, the barometer continuously compares the readings of the pressure sensors against one another and provides information on whether these are within the set internal difference criteria. This unique feature provides redundancy in pressure measurement. Thus, users get a stable and reliable pressure reading at all times as well as a pre-indication of when to service or re-calibrate the barometer.

### Optional HMP155 Humidity and temperature probe

The new Vaisala HUMICAP® Humidity and Temperature Probe HMP155 provides reliable humidity and temperature measurement.

### Long-term stability

The HMP155 has a new generation Vaisala HUMICAP®180R sensor that has excellent stability and withstands harsh environments well. The probe structure is solid and the sensor is protected with a sintered teflon filter, which gives maximum protection against liquid water, dust, and dirt.

### Fast temperature measurement

What's more, with its fast response time, the additional temperature probe for the HMP155 is ideal for measurement in environments with rapidly changing temperatures.

### MI70 Hand-held indicator for spot-checking applications

The Vaisala Measurement Indicator MI70 is a user-friendly indicator for demanding spot-checking measurements. It is ideal for field checking and calibration of Vaisala's fixed instruments.

### Easy-to-use user interface and three-variable display

The MI70 features a multilingual, menu-based user interface, and a clear graphical LCD display. Overall three measurement parameters can be displayed and logged into the meter's memory at the same time. One or two probes or transmitters can be connected simultaneously.

### MI70 Link

The optional MI70 Link Windows® software and the USB connection cable form a practical tool for transferring logged data and real time measurement data from the MI70 to a PC.

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# Vaisala Barometric Pressure Transfer Standard PTB330TS

## Technical data

These specifications apply when MI70, PTB330 and HMP155 are used together in the PTB330TS product. For individual specifications, please refer to the product documentation and brochures of the PTB330 and HMP155.

## General

| | |
|---|---|
| Operating temperature range | -10 ... +40 °C (+14 ... +104 )°F |
| Operating humidity range | non-condensing |
| Maximum pressure limit | 5000 hPa abs. |
| Power supply | Rechargeable NiMH battery pack with AC-adapter or 4xAA-size alkalines, type IEC LR6 |
| Operation time (using rechargeable battery pack) | |
| Continuous use with PTB330 | 11 h typical at +20 °C (+68 °F) |
| Datalogging use | up to 30 days |
| Menu languages | English, Chinese, French, Spanish, German, Russian, Japanese, Swedish, Finnish |
| Display | LCD with backlight, graphic trend display of any parameter, character height up to 16 mm |
| Data logging capacity | 2700 points |
| Alarm | audible alarm function |

PTB330TS is in conformity with the following EU directives:
- EMC Directive (2004/108/EC) Complies with the EMC product family standard EN61326-1, Electrical equipment for measurement control and laboratory use - Basic immunity test requirements.
- Low Voltage Directive (2006/95/EC)
- ROHS Directive (2002/95/EC)

## Performance

### Barometric pressure (PTB330)

| | |
|---|---|
| Measurement range | 500 ... 1100 hPa |
| Linearity* | ±0.05 hPa |
| Hysteresis* | ±0.03 hPa |
| Repeatability* | ±0.03 hPa |
| Calibration uncertainty** | ±0.07 hPa |
| Accuracy at +20 °C (+68 °F) *** | ±0.10 hPa |
| Temperature dependence**** | ±0.1 hPa |
| Total accuracy -40...+60 °C (-40...+140 °F) | ±0.15 hPa |
| Long-term stability | ±0.1 hPa/year |
| Settling time at power-up (one sensor) | 4 s |
| Response time (one sensor) | 2 s |
| Acceleration sensitivity | negligible |

* Defined as ±2 standard deviation limits of endpoint nonlinearity, hysteresis or repeatability error.
** Defined as ±2 standard deviation limits of inaccuracy of the working standard including traceability to NIST.
*** Defined as the root sum of the squares (RSS) of endpoint non-linearity, hysteresis error, repeatability error and calibration uncertainty at room temperature.
**** Defined as ±2 standard deviation limits of temperature dependence over the operating temperature range.

### Relative humidity (HMP155)

| | |
|---|---|
| Measurement range | 0 ... 100 %RH |
| Accuracy (incl. non-linearity, hysteresis and repeatability) at +15 ... +25 °C (+59 ... +77 °F) | |
| | ±1 %RH (0 ... 90 %RH) |
| | ±1.7 %RH (90 ... 100 %RH) |
| -10 ... +40 °C (-4 ... 104 °F) | ±(1.0 + 0.008 x reading) %RH |
| Factory calibration uncertainty (+20 °C /+68 °F) | |
| | ±0.6 %RH (0 ... 40 %RH)* |
| | ±1.0 %RH (40 ... 97 %RH)* |
| Humidity sensor | HUMICAP180R |
| | HUMICAP180RC |
| Response time at +20 °C in still air with a sintered PTFE filter | |
| 63 % | 20 s |
| 90 % | 60 s |

* Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.

### Temperature (HMP155)

| | |
|---|---|
| Measurement range | -10 ... +40 °C (+14 ... +104 °F) |
| Accuracy | |
| -10 ... +20 °C | ±(0.176 - 0.0028 x temperature) °C |
| +20 ... +40 °C | ±(0.07 + 0.0025 x temperature) °C |
| Accuracy over temperature range (see graph overleaf) | |
| Temperature sensor Pt100 RTD 1/3 Class B IEC 751 | |
| Response time with additional temperature probe in 3 m/s air flow | |
| 63 % | <20 s |
| 90 % | <35 s |



# Technical data

### Available Parameters

| | |
|---|---|
| Pressure parameters | P, P3h, HCP, QFE, QNH |
| Humidity and temperature parameters | RH, T, Tdf, Td, x, Tw |

### Inputs and outputs

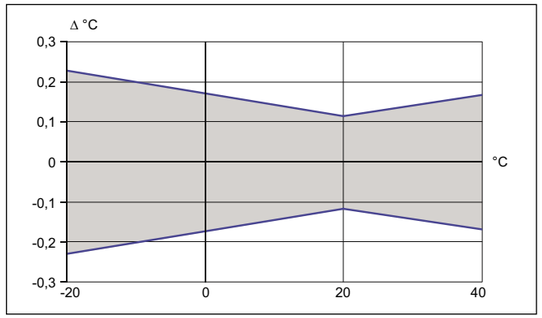
| | |
|---|---|
| MI70 probe ports | 2 |
| MI70 data interface | RS-232 (accessible only with MI70 Link software) |
| PTB330 supply voltage | 10 ... 35 VDC (if not powered by MI70) |
| PTB330 data interface | RS-232C |
| PTB330 serial I/O connectors | RJ45 (service port) Male 8-pin M12 (user port) |
| HMP155 data interface | RS-485 |
| HMP155 serial I/O connector | Male 8-pin M12 |

### Mechanics

| | |
|---|---|
| PTB330 | |
| Housing material | G-AlSi 10 Mg (DIN 1725) |
| Housing classification | IP65 |
| Pressure connector | M5 (10-32) internal thread |
| Pressure fitting | barbed fitting for 1/8" I.D. tubing or quick connector with shutoff valve for 1/8" hose |
| HMP155 | |
| Housing material | PC |
| Housing classification | IP66 |
| Additional T-probe cable length | 2 m |
| Cable material | PUR |
| Sensor protection | Sintered PTFE |
| MI70 MEASUREMENT INDICATOR | |
| Housing classification | IP54 |
| Housing material | ABS/PC blend |
| TRANSPORT CASE | |
| Housing classification (when closed) | IP67 |
| Plastic parts | TTX01®, PP+SEBS, POM |
| Metal parts | stainless steel AISI303 |
| Interior foam material | PE and polyether |
| Weight with all instruments and typical accessories | 5.9 kg |
| Exterior dimensions (LxWxH) | 405x330x165 mm (15.94x12.99x6.50) inch |

### Accessories

| | |
|---|---|
| PTB330 | |
| MI70 – PTB330 Spiral Cable | 223235SP |
| USB-RJ45 serial connection cable | 219685 |
| Serial connection cable | 19446ZZ |
| Barbed fitting 1/8" | 19498SP |
| Quick Connector 1/8" | 220186 |
| Transport case with interior foams and tabletop casing for PTB330 | 224068SP |
| Tabletop casing for PTB330 | 224064SP |
| MI70 | |
| USB cable for MI70, includes MI70 Link software | 219687 |
| MI70 Link software | MI70LINK |
| MI70 connection cable to HMT330, MMT330, DMT340, HMT100, PTB330 | 211339 |
| MI70 battery pack | 26755 |
| variety of AC adapters available | |
| HMP155 | |
| HMP155 – MI70 connection cable | 221801 |
| Protection set for HMP155 calibration buttons: protective cover, 2 O-rings and protective plug | 221318 |
| USB cable for HMP155 | 221040 |
| Sintered teflon filter + O-ring | 219452SP |
| Humidity sensor | HUMICAP180R |
| Humidity Calibrator | HMK15 |




*Accuracy of HMP155 temperature measurement over temperature range*

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# PTB210 Digital Barometer

*The Vaisala BAROCAP® Digital Barometer PTB210 is a reliable outdoor barometer that withstands harsh conditions.*

## For harsh environments

The Vaisala BAROCAP® Digital Barometer PTB210 is ideal for outdoor installations and harsh environments. The barometers are designed to operate in a wide temperature range, and the electronics housing provides IP65 (NEMA 4) standardized protection against sprayed water.

### Features/Benefits

- 500 ... 1100 hPa or 50 ... 1100 hPa pressure ranges with serial output
- Different scalings between 500 ... 1100 hPa with analog output
- Electronics housing IP65 protected against sprayed water
- Accurate and stable measurement
- NIST traceable (certificate included)

The PTB210 barometers are ideal for use in applications such as weather stations, data buoys and ships, airports, and agrology. They are also an excellent solution for monitoring barometric pressure in industrial equipment such as laser interferometers and engine test benches.

## Several pressure ranges

The PTB210 barometers are designed for various pressure ranges. They are available in two basic configurations: serial output for 500 ... 1100 hPa and 50 ... 1100 hPa and analog output with different scalings between 500 ... 1100 hPa.

## Accurate and stable measurement

All the PTB210 barometers are digitally adjusted and calibrated by using electronic working standards. A higher accuracy barometer, that is fine-tuned and calibrated against a High Precision Pressure Calibrator, is available for the 500 ... 1100 hPa pressure range.

In addition, the PTB210 integrates directly with Vaisala Static Pressure Head Series SPH10/20. This pairing offers accurate measurement in all wind conditions.

*The PTB210 paired with the SPH10 Static Pressure Head.*

## Vaisala BAROCAP® technology

The PTB210 barometers use the Vaisala BAROCAP® Sensor, a silicon capacitive absolute pressure sensor developed by Vaisala for barometric pressure applications. The Vaisala BAROCAP® Sensor provides excellent hysteresis and repeatability characteristics and outstanding temperature and long-term stability. All PTB210 barometers are delivered with a factory calibration certificate which is NIST traceable.



# Technical data

### Operating range (1hPa=1mbar)

| | |
|---|---|
| Pressure range (order specified) | |
| serial output | 500 ... 1100 hPa |
| | 50 ... 1100 hPa |
| analog output | 500 ... 1100 hPa |
| | 600 ... 1060 hPa |
| | 800 ... 1060 hPa |
| | 900 ... 1100 hPa |
| Operating temperature range | -40 ... +60 °C (-40 ... +140 °F) |
| Humidity range | non-condensing |

### Accuracy

SERIAL OUTPUT (units in hPa)

| Pressure range | 500 ... 1100 | | 50 ... 1100 |
|---|---|---|---|
| | Class A | Class B | |
| Non linearity* | ± 0.10 | ± 0.15 | ± 0.20 |
| Hysteresis* | ± 0.05 | ± 0.05 | ± 0.10 |
| Repeatability* | ± 0.05 | ± 0.05 | ± 0.10 |
| Calibration uncertainty** | ± 0.07 | ± 0.15 | ± 0.20 |
| Accuracy at +20 °C (+68 °F)*** | ± 0.15 | ± 0.20 | ± 0.35 |
| Temperature dependence**** | ± 0.20 | ± 0.20 | ± 0.40 |
| Total accuracy*** | ± 0.25 | ± 0.30 | ± 0.50 |
| -40 ... +60 °C (-40 ... +140 °F) | | | |
| Long term stability (hPa/year) | ± 0.10 | ± 0.10 | ± 0.20 |

ANALOG OUTPUT

| | |
|---|---|
| Non linearity* | ± 0.20 hPa |
| Hysteresis* | ± 0.05 hPa |
| Repeatability* | ± 0.05 hPa |
| Calibration uncertainty** | ± 0.15 hPa |
| Accuracy at +20 °C (+68 °F)*** | ± 0.30 hPa |
| Temperature dependence**** | ± 0.50 hPa |
| Total accuracy*** -40 ... +60 °C (-40 ... +140 °F) | ± 0.60 hPa |
| Long term stability | ± 0.10 hPa/year |

* Defined as the ±2 standard deviation limits of end point non-linearity, hysteresis error or repeatability error.

** Defined as ±2 standard deviation limits of inaccuracy of the working standard including traceability to NIST.

*** Defined as the root sum of the squares (RSS) of end point non-linearity, hysteresis error, repeatability error and calibration uncertainty at room temperature.

**** Defined as ±2 standard deviation limits of temperature dependence over the operating temperature range.

### General

(· Factory setting)

| | |
|---|---|
| SERIAL OUTPUT | |
| Current consumption | |
| normal mode | < 15 mA· |
| power down mode | < 0.8 mA |
| shutdown mode | 0.2 mA |
| Shutdown | ON/OFF |
| Settling time at power up | 2 s |
| Serial I/O (factory setting·) | RS232C |
| | RS232C /TTL (optional) |
| | RS485, non isolated (optional) |
| parity | none, even·, odd |
| data bits | 7·, 8 |
| stop bits | 1·, 2 |
| Baud rate | 1200, 2400, 4800, 9600·, 19200 |
| Response time | 1 s· |
| Resolution | 0.01 hPa (1 measurement/s) |
| | 0.03 hPa (10 measurements/s) |
| ANALOG OUTPUT | |
| Outputs | 0 ... 5 VDC, 0 ... 2.5 VDC (order specified) |
| Current consumption | |
| normal mode | < 8 mA |
| shutdown mode | 0.2 mA |
| Shutdown | ON/OFF |
| Response time | 500 ms |
| Resolution | 300 µV |
| Measurement rate | 3 measurements/s |
| ALL MODELS | |
| Supply voltage (reverse polarity protected) | |
| with RS232/TTL output | 5 ... 28 VDC |
| with RS485 or analog output | 8 ... 18 VDC |
| Max. pressure | 5 000 hPa abs. |
| Pressure connector | M5 (10-32) internal thread |
| Pressure fitting | barbed fitting for 1/8" I.D. tubing |
| Housing | |
| electronics | IP65 (NEMA 4) |
| sensor | IP53 |
| Housing material | PC plastic |
| Supply/output cable length | 1, 2, 3, 5 or 10 m |
| Instrument | 110 g |
| Cable | 28 g/m |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Generic Environment |

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# PTB110 Barometer for Industrial Use

*The Vaisala BAROCAP® Barometer PTB110 offers outstanding long-term stability.*

## Features/Benefits

- Vaisala BAROCAP® sensor
- Several pressure ranges
- Accuracy ±0.3 hPa at +20 °C
- Long-term stability
- On/off control with external trigger
- Output voltage 0 ... 2.5 or 0 ... 5 VDC
- Current consumption less than 4 mA
- Mountable on a (35 mm wide) DIN rail
- NIST traceable (certificate included)

## PTB110

The Vaisala BAROCAP® Barometer PTB110 is designed both for accurate barometric pressure measurements at a room temperature and for general environmental pressure monitoring over a wide temperature range.

## Vaisala BAROCAP® technology

The PTB110 barometer uses the Vaisala BAROCAP® Sensor, a silicon capacitive absolute pressure sensor developed by Vaisala for barometric pressure measurement applications.

The sensor combines the outstanding elasticity characteristics and mechanical stability of single-crystal silicon with the proven capacitive detection principle.

## Accuracy and stability

The excellent long-term stability of the barometer minimizes or even removes the need for field adjustment in many applications.

## Applications

The PTB110 is suitable for a variety of applications, such as environmental pressure monitoring, data buoys, laser interferometers, and in agriculture and hydrology.

The compact PTB110 is especially ideal for data logger applications as it has low power consumption. Also an external On/Off control is available. This is practical when the supply of electricity is limited.



# Technical data

| **Operating range** (1 hPa=1mbar) | |
|---|---|
| Pressure ranges | 500 ... 1100 hPa |
| | 600 ... 1100 hPa |
| | 800 ... 1100 hPa |
| | 800 ... 1060 hPa |
| | 600 ... 1060 hPa |
| Temperature range | -40 ... +60 °C (-40 ... +140 °F) |
| Humidity range | non-condensing |

| **General** | |
|---|---|
| Supply voltage | 10 ... 30 VDC |
| Suppply voltage control | with TTL level trigger |
| Supply voltage sensitivity | negligible |
| Current consumption | less than 4 mA |
| in shutdown mode | less than 1 µA |
| Output voltage | 0 ... 2.5 VDC |
| | 0 ... 5 VDC |
| Output frequency | 500 ... 1100 Hz |
| Resolution | 0.1 hPa |
| Load resistance | minimum 10 kohm |
| Load capacitance | maximum 47 nF |
| Settling time | 1 s to reach full accuracy after power-up |
| Response time | 500 ms to reach full accuracy after a pressure step |
| Acceleration sensitivity | negligible |
| Pressure connector | M5 (10-32) internal thread |
| Pressure fitting | barbed fitting for 1/8" |
| Minimum pressure limit | 0 hPa abs |
| Maximum pressure limit | 2000 hPa abs |
| Electrical connector | removable connector for 5 wires (AWG 28 ... 16) |
| Terminals | Pin 1: external triggering |
| | Pin 2: signal ground |
| | Pin 3: supply ground |
| | Pin 4: supply voltage |
| | Pin 5: signal output |
| Housing material, plastic cover | ABS/PC blend |
| Housing classification | IP32 |
| Metal mounting plate | Al |
| Weight | 90 g |
| Electromagnetic compatibility | Complies with EMC standard EN 61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements - for use in industrial locations |

| **Accuracy** | |
|---|---|
| Linearity* | ±0.25 hPa |
| Hysteresis* | ±0.03 hPa |
| Repeatability* | ±0.03 hPa |
| Calibration uncertainty** | ±0.15 hPa |
| Accuracy at +20 °C*** | ±0.3 hPa |

* Defined as ±2 standard deviation limits of end-point non-linearity, hysteresis error or repeatability error.

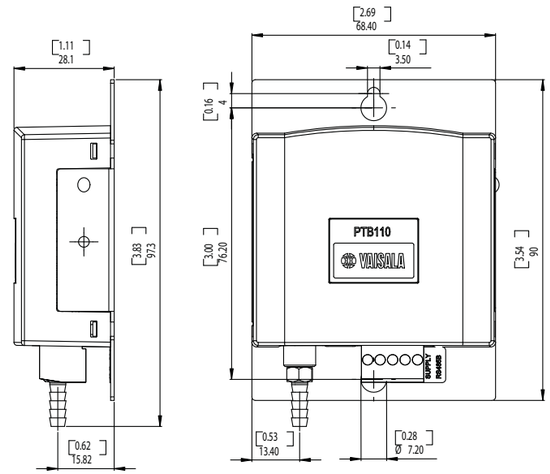
** Defined as ±2 standard deviation limits of inaccuracy of the working standard including traceability to NIST.

*** Defined as the root sum of the squares (RSS) of end-point non-linearity, hysteresis error, repeatability error and calibration uncertainty at room temperature.

| TOTAL ACCURACY AT | |
|---|---|
| +15 ... +25 °C (+59 ... +77 °F) | ±0.3 hPa |
| 0 ... +40 °C (+32 ... +104 °F) | ±0.6 hPa |
| -20 ... +45 °C (-4 ... +113 °F) | ±1.0 hPa |
| -40 ... +60 °C (-40 ... +140 °F) | ±1.5 hPa |
| Long-term stability | ±0.1 hPa/year |

## Dimensions

Dimensions in mm (inches)

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# SPH10/20 Static Pressure Heads for Minimizing Wind Induced Error

Wind induced effects are one of the main sources of error when measuring barometric pressure. Variations due to strong and gusty wind can be overcome by using a static pressure head to 'filter out' the effect of dynamic pressure.

The Vaisala Static Pressure Head Series SPH10/20 are designed to minimize the errors caused by wind. The wind tunnel tested structure is both horizontally and vertically symmetrical. This design ensures reliable barometric pressure measurements in all weather.

## Ideal for outdoor installations

Vaisala's static pressure heads are available in two models: the Vaisala Static Pressure Head SPH10 is a basic version, and the Vaisala Static Pressure Head SPH20 is a heated version for reliable operation in snowy and icy conditions. The warmed SPH20 contains a thermostat that switches on the warming power at temperatures, where the risk of icing may occur.

Composed of ultraviolet stabilized PC plastics and offshore aluminium, the SPH10/20 static pressure heads are durable and weather resistant.

The SPH10/20 protects against rain and condensed water, thus preventing capillary condensation of a water column in the pressure channel which results in pressure error. The drain holes in the lower plate allow rain and water to flow out. The static pressure heads have internal netting which prevents insects and debris from blocking the pressure channel.

## Carefree maintenance

The SPH10/20 static pressure heads are easy to install and disassemble, service and clean – even at the installation site. Vaisala BAROCAP® Digital Barometer PTB210 can be installed directly on top of the SPH10/20 static pressure heads. Other barometers can be connected to the heads with pressure tubing.

SPH10 and SPH20 are a perfect pair for all Vaisala barometers. They ensure an accurate and reliable measurement in all weather conditions.

*The SPH10/20 is easy to install and connect. In the picture, a SPH10 is connected to a PTB210 barometer.*

### Features/Benefits

- Minimizes wind induced error
- Reliable barometric pressure measurement in all weather
- Wind tunnel tested structure
- Easy-to-clean
- Easy-to-install



# Technical data

### General

| | |
|---|---|
| Operating temperature | -60 ... +80 °C (-76 ... +176 °F) |
| Weight | |
| SPH10 | 800 g |
| SPH20 | 1360 g |
| Material | PC plastic, offshore aluminium |
| Mounting | with 2 bolts (M6 X 20 mm min) |
| Hose connection | barbed fitting for 4 mm I.D. hose or Rp1/4 thread (parallel) |

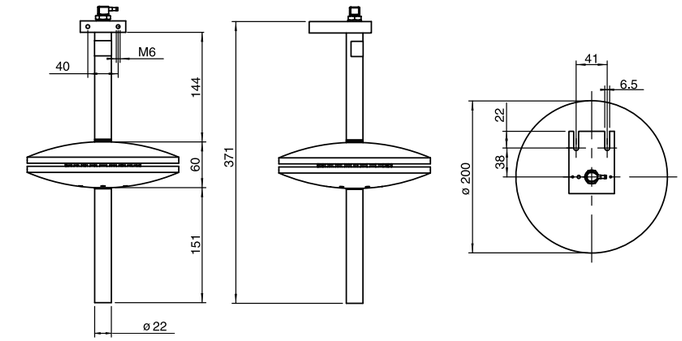
### SPH20

| | |
|---|---|
| Electrical connections | M12 connector |
| Power supply | factory setting 12 V |
| | changed connection 24 V |
| Thermostat switching temperature | |
| On | +4 °C (±3 °C) |
| | +39.2 °F (±4.4 °F) |
| Off | +13 °C (±3 °C) |
| | +55.4 °F (±4.4 °F) |
| Power consumption during heating | 70 W |

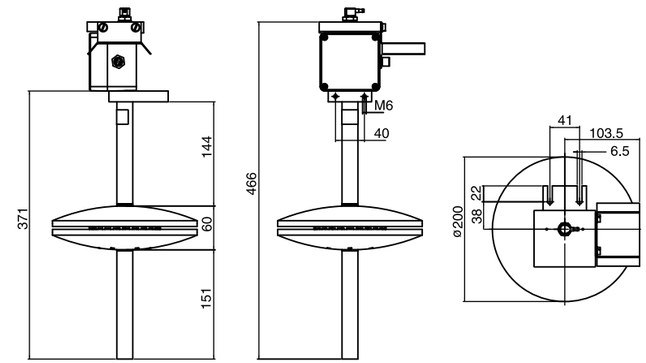
### Dimensions

Dimensions in mm

SPH10




SPH20

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# Vaisala Weather Transmitter WXT520
# Access to Real Time Weather Data

*The WXT520 has an automatic control circuit that switches the heating on at low temperatures.*

## Features/Benefits

- Measures 6 most essentialweather parameters
- Accurate and stable
- Low power consumption – works also with solar panels
- Compact, light-weight
- Easy to install with one-bolt mounting method
- No moving parts
- Heating available
- Vaisala Configuration Tool for pc
- USB connection
- IP66 housing with mounting kit
- Applications: weather stations, dense networks, harbors, marinas

## WXT520

The Vaisala Weather Transmitter WXT520 measures barometric pressure, humidity, precipitation, temperature, and wind speed and direction.

To measure wind speed and direction, the WXT520 has the Vaisala WINDCAP®sensor that uses ultrasound to determine horizontal wind speed and direction.
The array of three equally spaced transducers on a horizontal plane is a Vaisala specific design. Barometric pressure, temperature, and humidity measurements are combined in the PTU module using capacitive measurement for each parameter. It is easy to change the module without any contact with the sensors.

The WXT520 is immune to flooding clogging, wetting, and evaporation losses in the rain measurement.

## Measuring acoustic precipitation

The WXT520 precipitation measurement is based on the unique Vaisala RAINCAP® Sensor, which detects the impact of individual rain drops. The signals exerting from the impacts are proportional to the volume of the drops. Hence, the signal from each drop can be converted directly to the accumulated rainfall.

The WXT520 measures accumulated rainfall, rain intensity and duration of the rain — all in real time.

The Vaisala RAINCAP® Sensor is the only maintenance-free precipitation sensor on the market.



# Technical data

### Wind

| | |
|---|---|
| SPEED | |
| range | 0 ... 60 m/s |
| response time | 250 ms |
| accuracy | |
| 0 ... 35 m/s | ±0.3 m/s or ±3%, whichever is greater |
| 35 m/s ... 60 m/s | ±5% |
| output resolutions and units | 0.1 m/s, 0.1km/h, 0.1 mph, 0.1 knots |
| DIRECTION | |
| azimuth | 0 ... 360° |
| response time | 250 ms |
| accuracy | ±3° |
| output resolution and unit | 1° |

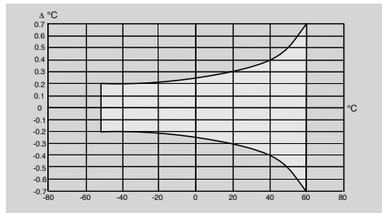
### Liquid precipitation

| | |
|---|---|
| RAINFALL | cumulative accumulation after the latest automatic or manual reset |
| output resolutions and units | 0.01 mm, 0.001 inches |
| accuracy | 5%* |
| RAINFALL DURATION | counting each ten-second increment whenever water droplet is detected |
| output resolution and unit | 10 s |
| RAIN INTENSITY | one-minute running average in ten-second steps |
| range | 0 ... 200 mm/h (broader range with reduced accuracy) |
| output resolutions and units | 0.1 mm/h, 0.01 inches/h |
| HAIL | cumulative amount of hits against the collecting surface |
| output resolutions and units | 0.1 hits/cm2, 0.01 hits/in2, 1 hits |
| HAIL DURATION | counting each ten-second increment whenever hailstone is detected |
| output resolution and unit | 10 s |
| HAIL INTENSITY | one-minute running average in ten-second steps |
| output resolutions and units | 0.1 hits/cm2h, 1 hits/in2h, 1 hits/h |

* Due to the nature of the phenomenon, deviations caused by spatial variations may exist in precipitation readings, especially in a short time scale. The accuracy specification does not include possible wind induced errors.

### Air temperature

| | |
|---|---|
| Range | -52 ... +60 °C (-60 ... +140 °F) |
| Accuracy for sensor at +20 °C | ±0.3 °C (±0.5 °F) |
| Accuracy over temperature range (see graph below) | |




| | |
|---|---|
| Output resolutions and units | 0.1 °C, 0.1 °F |

### Barometric pressure

| | |
|---|---|
| Range | 600 ... 1100 hPa |
| Accuracy | ±0.5 hPa at 0 ... +30 °C (+32 ... +86 °F)<br>±1 hPa at -52 ... +60 °C (-60 ... +140 °F) |
| Output resolutions and units | 0.1 hPa, 10 Pa, 0.0001 bar, 0.1 mmHg, 0.01 inHg |

### Relative humidity

| | |
|---|---|
| Range | 0 ... 100 %RH |
| Accuracy | ±3 %RH within 0 ... 90 %RH<br>±5 %RH within 90 ... 100 %RH |
| Output resolution and unit | 0.1 %RH |

### General

| | |
|---|---|
| Operating temperature | -52 ... +60 °C (-60 ... +140 °F) |
| Storage temperature | -60 ... +70 °C (-76 ... +158 °F) |
| Operating voltage | 5 ... 32 VDC |
| Typical power consumption | 3 mA at 12 VDC (with defaults) |
| Heating voltage | 5 ... 32 VDC / 5 ... 30 $VAC_{RMS}$) |
| Serial data interface | SDI-12, RS-232, RS-485, RS-422, USB connection, |
| Weigth | 650 g (1.43 lb) |
| Housing | IP65 |
| Housing with mounting kit | IP66 |

### Electromagnetic compatibility

| | |
|---|---|
| Complies with EMC standard EN61326-1; Industrial Environment IEC standards | IEC 60945/61000-4-2 ... 61000-4-6 |

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# WMT52 Ultrasonic Wind Sensor for Accurate and Stable Measurement

*The Vaisala WINDCAP® Ultrasonic Wind Sensor WMT52 - stable and inexpensive wind measurement for demanding applications.*

## Features/Benefits

- Measures horizontal wind speed and wind direction
- Triangular design ensures excellent data availability
- No moving parts
- Maintenance-free
- Optional heating available
- Compact, durable and robust
- Low power consumption
- IP66 housing with mounting kit
- Applications: marine, wind energy, environmental monitoring

## Proven Vaisala performance

The Vaisala WINDCAP® Ultrasonic Wind Sensor WMT52 incorporates decades of Vaisala experience in wind measurement using ultrasound to determine horizontal wind speed and direction.

With no moving parts, the WMT52 has high sensitivity as the measurement time constant and starting threshold are virtually zero. This makes it superior to the conventional mechanical wind sensors.

The WMT52 is designed to operate without periodic field calibration and maintenance.

## Applications

The WMT52 is ideal for use in marine applications as the housing with the mounting kit is water resistant. The WMT52 is also suitable for wind energy and environmental monitoring, for example, for measuring the distribution of air pollution and road tunnel ventilation.

## Easy to install

The WMT52 is delivered fully assembled and configured from the factory. With the Vaisala Configuration Software Tool you can change the settings, such as averaging times, output mode, update intervals, measured variables and message contents.

The WMT52 can be mounted either on top of a pole mast or on a cross arm.

When using the optional mounting kit, the north alignment needs to be performed only once.

## Heating

The optional heating available in the WMT52 assists measurements in the freezing weather conditions and during snowfall.

As the heating circuit is independent of the operational power, separate supplies can be used. Heating is switched on automatically at low temperatures, well before the freezing point.

## Low power consumption

The WMT52 has very low power consumption; during the idle mode the device typically consumes about 2 ... 3 mW.



# Technical data

## Wind

| | |
|---|---|
| WIND SPEED | |
| Range | 0 ... 60 m/s |
| Response time | 250 ms |
| Available variables | average, maximum, and minimum |
| Accuracy | |
| 0 ... 35 m/s | ±0.3 m/s or ±3 % whichever is greater |
| 35 m/s ... 60 m/s | ±5 % |
| Output resolution | 0.1 m/s (km/h, mph, knots) |
| WIND DIRECTION | |
| Azimuth | 0 ... 360° |
| Response time | 250 ms |
| Available variables | average, maximum, and minimum |
| Accuracy | ±3° |
| Output resolution | 1° |
| MEASUREMENT FRAME | |
| Averaging time | 1 ... 3600 s (=60 min), at one second steps on the basis of samples taken at 4 Hz rate (configurable) |
| Update interval | 1 ... 3600 s (=60 min), at one-second steps |

## General

| | |
|---|---|
| Self-diagnostics | separate supervision message, unit/status fields to validate measurement quality |
| Start-up | automatic, <10 s from power on to the first valid output |
| Serial data interface | SDI-12, RS-232, RS-485, RS-422, USB connection |
| Communication protocols | SDI-12 v1.3, ASCII automatic & polled, NMEA 0183 v. 3.0 with query option |
| Baud rate | 1200 ... 115 200 |
| Operating temperature | -52 ... +60 °C (-60 ... +140 °F) |
| Storage temperature | -60 ... +70 °C (-76 ... +158 °F) |
| Dimensions | |
| height | 139 mm (5.7") |
| diameter | 114 mm (4.49") |
| weight | 510 g (1.12 lb) |
| Housing | IP65 |
| Housing with mounting kit | IP66 |
| Vibration | IEC 60945 paragraph 8 |

## Power supply

| | |
|---|---|
| Operating voltage | 5 ... 32 VDC |
| Power consumption on average | |
| minimum | 0.1 mA at 12 VDC |
| maximum | 14 mA at 5 VDC |
| typical | 3 mA at 12 VDC (default measuring intervals) |
| Heating voltage | 5 ... 32 VDC / 5 ... 30 $VAC_{RMS}$) |

## Accessories

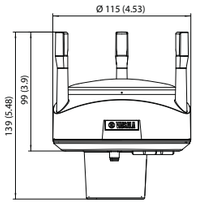
| | |
|---|---|
| Mounting kit | 212792 |
| Bird spike kit | 212793 |
| Surge protector for sensor | WSP150 |

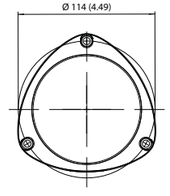
## Electromagnetic compatibility

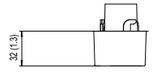
| | |
|---|---|
| Complies with EMC standard: EN61326-1, Industrial Environment | |
| IEC standards | IEC 60945/61000-4-2 ... 61000-4-6 |

## Dimensions

Dimensions in mm (inches)




mounting kit

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# WA15 Wind Set for High Performance Wind Measurement

*The WA15 is based on accurate sensors installed on a large crossarm. It is designed for demanding wind measurement applications.*

With a proven track record of successful installations, the Vaisala Wind Set WA15 has earned its reputation as the industry standard in the wind sensor market.

The WA15 consists of a Vaisala Anemometer WAA151, a Vaisala Wind Vane WAV151, an optional crossarm, a power supply and cabling.

## Anemometer with excellent linearity

The WAA151 is a fast response, low-threshold anemometer. Three lightweight, conical cups mounted on the cup wheel, provide excellent linearity over the entire operating range, up to 75 m/s.

A wind-rotated chopper disc attached to the shaft of the cup wheel cuts an infrared light beam 14 times per revolution. This generates a pulse output from the phototransistor.

The output pulse rate is directly proportional to wind speed (e.g. 246 Hz = 24.6 m/s). However, for the highest accuracy, the characteristic transfer function should be used to compensate for starting inertia.
(See technical data.)

## Sensitive wind vane

The WAV151 is a counter-balanced, low-threshold, optoelectronic wind vane. Infrared LEDs and phototransistors are mounted on six orbits on each side of a 6-bit GRAY-coded disc. Turned by the vane, the disc creates changes in the code received by the phototransistors. The output code resolution is ±2.8°.

## Heated bearings withstand cold weather

Heating elements in the shaft tunnels of both the anemometer and vane keep the bearings above freezing in cold climates.

## Complete package available

The anemometer and vane are designed to be mounted on Vaisala crossarms.

The WHP151 power supply provides the operating and heating power needed for the WA15. The power supply, as well as the signal and power cables are available as options.

### Features/Benefits

- High-performance wind measurement set
- Long and successful track record in meteorological applications
- Accurate wind speed and direction measurement
- Low measurement starting threshold
- Conical anemometer cups provide excellent linearity
- Heated shaft prevents bearings from freezing

# Technical data

## Vaisala Wind Set WA15

### Options and accessories

| | |
|---|---|
| Crossarm and termination box | WAC151 |
| 16-lead signal cable | ZZ45048 |
| 6-lead power cable | ZZ45049 |
| Crossarm and analog transmitter | WAT12 |
| 6-lead cable for signal and power | ZZ45049 |
| Crossarm and serial RS485 transmitter | WAC155 |
| Serial RS485 transmitter card | WAC155CB |
| Power supply | WHP151 |
| Set of bearings and gasket | 16644WA |
| Cup assembly | 7150WA |
| Tail assembly | 6389WA |



# Technical data

## Vaisala Anemometer WAA151

### Wind speed

| | |
|---|---|
| Measurement range | 0.4 ... 75 m/s |
| Starting threshold | < 0.5 m/s * |
| Distance constant | 2.0 m |
| Characteristic transfer function | U = 0.328 + 0.101 × R |
| (where U = wind speed [m/s], R = output pulse rate [Hz]) | |
| Accuracy (within range 0.4 ... 60 m/s) | |
| with characteristic transfer function | ± 0.17 m/s ** |
| with transfer function U = 0.1 × R | ± 0.5 m/s*** |

### General

| | |
|---|---|
| Operating power supply | $U_{in}$ = 9.5 ... 15.5 VDC, 20 mA typical |
| Heating power supply | AC or DC 20 V, 500 mA nominal |
| Output | 0 ... 750 Hz square wave |
| Transducer output level | |
| with $I_{out}$ < +5 mA | high state > $U_{in}$-1.5 V |
| with $I_{out}$ > –5 mA | low state < 2.0 V |
| Settling time after power turn-on | < 30 µs |
| Plug 6-PIN | MIL-C-26482 type |
| Cabling | 6-wire cable through crossarm |
| Recommended connector at cable end | SOURIAU MS3116F10-6P |
| Operating temperature with heating | -50 ... +55 °C (-58 ... +131 °F) |
| Storage temperature | -60 ... +70 °C (-76 ... +158 °F) |
| Material | |
| housing | AlMgSi, grey anodized |
| cups | PA, reinforced with carbon fibre |
| Dimensions | 240 (h) × 90 (Ø) mm |
| Swept radius of cup wheel | 91 mm |
| Weight | 570 g |

### Test compliance

| | |
|---|---|
| Wind tunnel tests | ASTM standard method D5096-90 |
| Exploratory vibration test | MIL-STD-167-1 |
| Humidity test | MIL-STD-810E, Method 507.3 |
| Salt fog test | MIL-STD-810E, Method 509.3 |

Complies with EMC standard EN61326-1:1997 + Am1:1998 + Am2:2001; Generic Environment

* Measured with cup wheel in position least favoured by flow direction. Optimum position gives approx. 0.35 m/s threshold.

** Standard Deviation

*** Typical error vs. speed with the "simple transfer function" used.

| RANGE (m/s) | 0-3 | 3-10 | 10-17 | 17-24 | 24-31 | 31-37 | 37-44 | 44-51 | 51-58 | 58-65 |
|---|---|---|---|---|---|---|---|---|---|---|
| ERROR (m/s) | -0.4 | -0.3 | -0.2 | -0.1 | 0.0 | +0.1 | +0.2 | +0.3 | +0.4 | +0.5 |

## Vaisala Wind Vane WAV151

### Wind direction

| | |
|---|---|
| Measurement range at wind speed 0.4 ... 75 m/s | 0 ... 360° |
| Starting threshold | <0.4 m/s |
| Resolution | ±2.8° |
| Damping ratio | 0.19 |
| Overshoot ratio | 0.55 |
| Delay distance | 0.4 m |
| Accuracy | better than ±3° |

### General

| | |
|---|---|
| Operating power supply | $U_{in}$ = 9.5 ... 15.5 VDC, 20 mA typical |
| Heating power supply | AC or DC 20 V, 500 mA nominal |
| Output code | 6-bit parallel GRAY |
| Output levels | |
| With $I_{out}$ < +5 mA | high state > $U_{in}$ –1.5 V |
| With $I_{out}$ > –5 mA | low state < 1.5 V |
| Settling time after power turn-on | < 100 µs |
| Plug 10-PIN | MIL-C-26482 type |
| Cabling | 10-wire cable through crossarm |
| Recommended connector at cable end | SOURIAU MS3116F12-10P |
| Operating temperature with heating | -50 ... +55 °C (-58 ... +131 °F) |
| Storage temperature | -60 ... +70 °C (-76 ... +158 °F) |
| Material | |
| housing | AlMgSi, grey anodized |
| wave | Alsi 12 anodized |
| Dimensions | 300 (h) × 90 (Ø) mm |
| Swept radius of vane | 172 mm |
| Weight | 660 g |

### Test compliance

| | |
|---|---|
| Wind tunnel tests | ASTM standard method D5366-93 |
| (for starting threshold, distance constant, transfer function) | |
| Exploratory vibration test | MIL-STD-167-1 |
| Humidity test | MIL-STD-810E, Method 507.3 |
| Salt fog test | MIL-STD-810E, Method 509.3 |

Complies with EMC standard EN61326-1:1997 + Am1:1998; Am2:2001; Generic Environment

VAISALA

For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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CE

# Vaisala Service Offering

Vaisala offers you calibration and maintenance services. You can choose from different options to customize your service agreement to cover all your Vaisala instruments.

## Easy and efficient calibration

Calibration is an essential part of measurement instrument maintenance. We offer Service agreements designed to fulfill your calibration and maintenance needs. Your instruments can be enrolled in the Calibration Reminder Program, which provides advance notification when regular calibration is due. For most Vaisala instruments, it also includes a calibration certificate with the 'before' and 'after' adjustment data.

You can choose a standard (factory) calibration or accredited calibration for a certain period of time. The standard (factory) calibration is traceable and ISO 9001 compliant.

The standard accreditation e.g. for Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMT330 includes seven humidity and one temperature point at room temperature. Vaisala also offers accredited calibrations for many of its products.

Vaisala Service Centers are accredited and their working procedures are approved by third party organizations. This is confirmed by the name and logo of the local accrediting body appearing on the report documentation. The documentation includes uncertainty calculations. Accredited calibrations are recommended especially for the measurement instruments that are used as transfer standards or in demanding measurement applications.

All accredited calibrations comply with ISO 17025 and are traceable to international standards.

You can also customize your calibration agreement, when needed.

## Lifetime accuracy with Vaisala service agreement

Regular maintenance is a key factor in ensuring measurement accuracy.

A Vaisala Service Agreement is a convenient way to gain access to professional support over the life cycle of your instruments. Agreements can be customized to support highest uptime and accuracy of your instruments.

A Vaisala Service Agreement is designed to fulfill customer needs – we will proceed step by step to find out the most suitable solution for your application. Let us do the job and you can concentrate on the results!

### Add benefits with options

The Vaisala Service Agreements are available with multiple optional services. You can select the options based on your needs.

- SCHEDULED PART DELIVERY: With this option Vaisala will keep an exchange unit (or units) in stock which will be shipped to you before the recommended calibration or maintenance time.
- PRIORITY TECHNICAL SUPPORT: Priority technical support increases uptime of your operations. Our response time to your technical inquiries can be agreed according to your need.
- EXTENDED WARRANTY: Secure your investment against accidental breakdowns for years to come – let Vaisala carry the risk of unpredictable repairs. You get all the benefits of Vaisala's standard warranty conditions, but for much longer.
- CALIBRATION REMINDER PROGRAM: By joining the Calibration Reminder Program, you'll receive a reminder for your upcoming calibration, along with detailed information on how to get the units calibrated at our service centers.
- REPAIR AND CALIBRATION: Vaisala Returns On the Web (ROW) is a system for easy shipping of Vaisala instruments for calibration or repair. The system processes your service order step-by-step and produces all required shipping documents and instructions needed.



VAISALA

10 D Gill Street, Woburn, MA 01801
USA and Canada Tel: 1-888-VAISALA (824-7252)
Brazil: 0800-891-7392
International Calls: + 781-933-4500
Fax: + 1-781-933-8029
Email: instruments@vaisala.com
www.vaisala.com/SERVICE

# Service and Calibration Standards Laboratory – Lifetime Accuracy from the Vaisala Service Center

*Using high quality instruments, the Vaisala Service Center performs calibration and adjustments in controlled environments.*

### Features/Benefits

- NIST traceable, ISO 9001:2000
- 5 day turnaround for calibrations
- Express service option
- ANSI-Z540 and ISO 17025:2005 compliant
- A2LA accreditation
- Calibration Reminder Program provides advance notification when regular calibration is due.
- FREE one year extended warranty with calibration
- Spare parts
- Reliable and professional standard calibrations

CERTIFIED SFS ORGANIZATION
ISO 9001

*ISO 9001 accreditations are recognized by major international accreditation organizations.*

A2LA ACCREDITED
2083.01

*Vaisala CSL is in compliance with ISO/IEC 17025:2005 and ANSI/NCSL Z540-1-1994 A2LA accreditation.*

### Vaisala lifetime accuracy

Vaisala's state-of-the-art Service Center and Calibration Standards Laboratory (CSL) provides service, calibration and adjustment for Vaisala's relative humidity, dewpoint, material moisture, barometric pressure and carbon dioxide instruments.

### ISO and A2LA Accreditation

The CSL received from the American Association for Laboratory Accreditation (A2LA) certification to ISO/IEC 17025:2005. The CSL is also certified to ISO 9001:2000 and meets the requirements of ANSI/NCSL Z540-1-1994. As a result the CSL is able to offer accredited calibrations for humidity, dewpoint and temperature instruments.

### Standard calibration

Calibration is an integral part of instrument maintenance. Vaisala Service performs multi-point and accredited calibrations and adjustments to ensure measurement accuracy.

One-point, on-site field calibrations are useful in identifying the need for additional calibration and adjustment.

Multi-point calibrations offer the advantage of high accuracy over the entire measurement range.

### Certificate verifies performance – both before and after

To verify results, a certificate is issued for each calibrated instrument. The certificate shows the readings both before and after adjustment. This system enables the user to easily monitor the performance of the calibrated instrument.

### Accredited calibration

Accredited calibrations ensure the highest measurement accuracy and are directly traceable to international standards. The measurement uncertainty in accredited calibrations is presented for all measurement points.

Accredited calibration is recommended for instruments that are used as a transfer standard, other demanding measurement applications, and/or to meet standards.

### Calibration Reminder Program with FREE Extended Warranty

Quality systems require calibration tracking. Participants in the Vaisala Calibration Reminder Program automatically receive a 'time to re-calibrate' notice. If the instrument is sent to Vaisala for recalibration within the initial warranty period, the warranty will be extended for one year – FREE.

### Customer Support

The Vaisala Help Desk, staffed by technical support engineers, is ready to provide assistance.

Call: 888.VAISALA (824.7252) or
Email: us-customerservice@vaisala.com

**All Vaisala calibrations comply with ANSI-Z540-1-1994 ISO/IEC 17025:2005 calibrations are also available.**

### Humidity Calibration

NIST traceable calibrations. Standard calibrations consist of four points with adjustments at 0% and 75.5% and linearity checked at 11.3% and 33 %RH, (97.6 %RH optional).

Two-pressure generator enables special NIST traceable calibrations:

- Any points between 10% to 95 %RH
- Temperature range +32...158 °F (0 to 70 °C)

### Temperature Calibration

- Temperature calibrations from -80 to +180 °C (-112 to +356 °F)
- NIST traceable temperature calibration within the specified range.

### Dewpoint Calibration

- Dewpoint calibrations from -94 to +68 °F (-70 to +20 °C)
- NIST traceable dewpoint calibration within the specified range.

### $CO_2$ Calibration

- Certified $CO_2$ calibration
- Calibration at:

0%: 2,000 ppm (0.2%);
3,000 ppm (0.3%);
5,000 ppm; 10,000 ppm; 20,000 ppm
5%: 10% and 20%

### Warranty Repair of Vaisala Instruments

For warranty repairs, no authorization from the customer is needed. Vaisala guarantees a one week turnaround from the date the instrument(s) are received.

### Non-Warranty Repair of Vaisala Instruments

For non-warranty repairs, you will be notified of the repair charge within one week of the lab receiving the instrument(s). Vaisala guarantees a one week turnaround from the authorization date.

### Express Service

Two-day guaranteed turnaround service is available for a nominal fee. When obtaining an RMA number please inform the Customer Service Representative if this service is desired.

### Maintenance Contracts

Maintenance contracts are available on an individual basis. Call your sales engineer to discuss the posibilities.
1-888-VAISALA (824-7252)

### Returning for Service

For service, call Vaisala's customer service department at 1-800-408-9454.

A Customer Service Representatives will assign an RMA (Return Material Authorization) number for returning the Vaisala instrument for recalibration or repair. Please reference this RMA number on all paperwork, and write it on the outside of the return package.

### Contact Information:

**Vaisala North American Service Center**

Vaisala Inc.
10-D Gill Street
Woburn, MA 01801
Tel: 781-933-4500
1-888-VAISALA (824-7252)
Fax: 781-933-8029

**Customer Service:**
Tel: 1-800-408-9454
Email: us-customerservice@vaisala.com

**Technical Support:**
Tel: 1-800-408-9456
Email: us-technicalsupport@vaisala.com
Web: www.vaisala.com/reminder

*Register for Vaisala's Recalibration Reminder Program and extend your warranty FREE! Call 1-800-408-9454.*



# Calibration is Our Core Operation

| Standard (factory) Calibrations | | | |
|---|---|---|---|
| Service Center | European Service Center | Asian Service Center | North American Service Center |
| Location | Helsinki, Finland | Tokyo, Japan | Boston, MA, USA |
| Humidity | √ | √ | √ |
| Temperature | √ | √ | √ |
| Dewpoint Temperature | √ | √ | √ |
| Barometric Pressure | √ | √ | √ |

*Table 1. Standard (factory) calibration is available globally in all Vaisala Service Centers.*

| Traceability of Measurement Parameters | | | | |
|---|---|---|---|---|
| | ISO9001 compliant | | ISO17025 compliant | |
| | Standard Calibration | Traceability | Accredited Calibration | Traceability |
| Relative Humidity | Yes | NIST | Yes | JCSS/NIST, Salt Solutions |
| Temperature | Yes | NIST | Yes | NIST |
| Dewpoint Temperature | Yes | NIST, JCSS | Yes | JCSS |
| Barometric Pressure | Yes | NIST | Yes | NIST |
| Carbon Dioxide | Yes | NIST, NMI | Not available | – |

*Table 2. Traceability of different measurement parameters.*

| Accredited Body | | | |
|---|---|---|---|
| Service Center | European Service Center | Asian Service Center | North American Service Center |
| Location, Laboratory, Code | Helsinki, Finland, K008 | Tokyo, Japan, 0123 | Boston, MA, USA, 112765 |
| | FINAS Finnish Accreditation Service K008 (EN ISO/IEC 17025) | MR IAJapan JCSS 0123 | ACCREDITED |
| **Accredited Parameters** | | | |
| Relative Humidity | √ | √ | √ |
| Temperature | √ | | √ |
| Dewpoint Temperature | | √ | √ |
| Barometric Pressure | √ | | |

*Table 3. Accredited parameters in Vaisala Service Centers.*

**FIXED PRICES for CALIBRATION and REPAIR (Effective 1/1/10)** *Shipping charges are not included in pricing.*

| Order Code: | **HUMIDITY: 5 Day Turn-around** | |
|---|---|---|
| RHCALA | 2% Standard Calibration* (0, 11, 33, 75% RH) | $150 |
| | HMW60/70 wall mount, (0, 33, 75 %RH) | $100 |
| RHCALD | 1% Calibration** (0, 11, 33, 75%RH) | $200 |
| | *Option of 97% available in place of any point or, 5 point including 97% for an additional fee of* | $75 |
| | *With high end calibration one of the adjustments is done at 97%RH.* | |
| | *Resulting accuracy is: ±3 or 2% < 90 %RH and ± 2 or 1% > 90 %RH.* | |
| COMBOCAL | Combination Calibration (5-point RH Cal 0, 11, 33, 75, 97 + 3-point Temp Cal 0°, 50°, 100 °C) | $425 |
| RHSERVA | Repair and 2% Calibration* | $250 |
| RHSERVD | Repair and 1% Calibration (Non Sensing Head Units) | $500 |
| RHSERVD-SHC | Repair and 1% Calibration** (Sensing head included) | $600 |
| ANALOGCAL1 | Forced output, 3-points at min, mid, max of scaling | $100 |
| ANALOGCAL2 | Actual values measured on outputs during calibration | $100 |
| RHCALPOINT | Special Humidity including certificate (11%…95% @ 0…70 °C): | |
| | ambient (Room Temperature) | $95 |
| | elevated temperatures | $150 |
| URGENTFEE | 2 Day Express Service (on RHCALA & RHCALD only) per unit *(Not available on dewpoint products, Accreditation/ or special points.)* | $50 |
| EVALUATION | | $100 |

** The Standard Calibration consists of a 4 point calibration with adjustments made at 0% and 75.5% and linearity checked at 11.3% and 33%. Temperature is verified at ambient.HMP42 Repair is RHSERVD*

*** 1% Calibration is standard for the HMP230 Series, HMP240 Series, HMP260 Series, HMI38 with HMP35E/36E/37E, HMT360 Series, HMI41/HMP46, HMT330 Series and HMP70 Series.*

**ISO 17025 Accredited Calibrations for Humidity, Temperature, Dewpoint and Pressure - See pages 202-209**

| | **TEMPERATURE: 5-7 Day Turn-around: includes certificate** | |
|---|---|---|
| TCAL | Calibration per point; minimum 2 points (range -80 °C …180 °C based on model) | $75 |
| RESPAN | Temperature Respanning for HMD/W 20/30, 60/70,& 61/71 units | $50 |
| | • *Temperature spans must be 40 °C (72 °F) apart for HMD/W 20/30, HMD/W60/70, and 61/71 units* | |
| | **CARBON DIOXIDE: 5 Day Turn-around** | |
| CO2CAL | Calibration (Zero and Span) (2000, 3000, 5000, 10,000, 20,000 PPM …1, 2, 3, 5, 10, 20%) | $125 |
| CO2SERV | Repair and Calibration | $250 |
| CO2CALIND | Calibration of GMP220 probes (3 points) | $200 |
| CO2SERVIND | Repair and Calibration of GMP220 probes | $400 |
| 216873 | GM70 Pump Service | $600 |
| 217084 | GMP343 Calibration (4-week turn-around) | $350 |
| 216880 | GMP343 Repair (4 week trun-around) | $650 |
| | **DEWPOINT: 5 to 10 Day Turn-around; includes certificate** | |
| DEWAL-STD | 3 point calibration (-50, -30, +10 °C) *Production Calibration Points* | $300 |
| DEWCAL | 3 point calibration (-40, -30, -20 °C) (Range -70…+20 C°) | $300 |
| | NOTE: $100 per point for -70…+20°C, $125 per point for +20…60 °C | |
| DEWCAL5 | 5 point calibration (-50, -40, -30, -20, -10 °C) | $450 |
| DEWSERV | 3 point repair and calibration (-40, -30, -20 °C) | $600 |
| DEWSERV5 | 5 point repair and calibration (-50, -40, -30, -20, -10 °C) | $700 |
| | • *DEWCAL Calibration is standard for the DMP74 and DMT242.* | |
| | **PRESSURE: Digital 3 Week Turn-around; Analog 1 Week Turn-around includes certificate** | |
| PCALDB | Analog Calibration (Class B, 1 week turn-around) | $125 |
| PSERVA | Analog Repair and Calibration (Class B) | $400 |
| | *PTB100A, PTB101C & PTA427, 6 point calibration @ 800, 850,900,950,1000,1050 hPa* | |
| | *PTB100B & PTB101B, 8 point calibration @ 600, 700, 800, 850, 900,1000, 1050 hPa* | |





| | | |
|---|---|---|
| PSERVDA | Digital Repair and Calibration (Class A) | $395 |
| PTUSERV | PTU300/PTU200 Repair and Calibration | $495 |
| URGENTFEE | Analog: 2-day turn-around from date unit received | $50 |
| | Digital: 2 week turn-around | $95 |
| | Oxygen calibration: 4-Week Turn-around | |
| OMT355 | Calibration 0 - 21% | $330 |
| OMT355 | Calibration 0- - 100% | $622 |
| | **DTS1 Calibration:** | |
| DTSCAL | Calibration | $ 200 |
| DTS1SERV1 | Calibration & sensor replacement (Minor Repair) | $500 |
| DTS1SERV2 | Calibration & Major Repair | $700 |
| | **WIND: 3 Week Turn-around** | |
| | Upgrades and Software WXT510 & WS425 | $250 |
| WSSERV | Mechanical Sensors | $600 |
| | Ultrasonic Sensors - Evaluation | $100 |
| | Ultrasonic Sensors - Repair | $750 |
| | WXT and WMT50 - Functional testing and/or PTU replacement | $250 |
| | WXT520 Service/WXT510 upgrade to WXT520 | $450 |
| | NOTE: WS425 units with orange transducers cannot be repaired. | |
| | **UNIT UPGRADES:** | |
| | Upgrade to All Parameters Version (Software): | $600 |
| | Upgrade HUMICAP from an H180 sensor to H180R sensor | $400 |
| | Upgrade HUMICAp from an H180C sensor to H180RC sensor | $600 |
| | **Adding Display/Keypad:** | |
| | HMT330 Series any single upgrade (i.e. software/display and analog channel) | $600 |
| | HMP230 Series | $600 |
| | HMT100 Display | $500 |
| | HMT360 Series | $600 |
| | GMT220 Series | $400 |
| | PTB220, PTB330, PTU300 Series | $600 |
| | **Adding Second Channel:** | |
| | HMT360 Series | $600 |
| | NOTE: All prices listed above include RH Calibration and Certificate | |
| | **Adding Data Logging or w/LANMofule** | |
| | Unit w/5.0SW | $600 |
| | Unit w/4.0SW | $800 |
| | **Adding Analog Output Option:** | |
| | PTB220, (Sent to Helsinki) PTB330, PTU300 | $600 |

**NOTES:**

**Pricing:**
Prices are subject to change without notice. All prices are FOB Woburn, MA.

**Shipments:**
Express Service, for next day shipments (if available) $50.

**Returns/Restocking:**
Unless otherwise noted on the Order Guides, standard unused products if resaleable as new, can be returned within 90 days of purchase with a Return Materials Authorization (RMA).
A 25% restocking fee will be charged for all returned products.

**Service Repairs:**
A Return Material Authorization (RMA) is necessary prior to sending products to Vaisala for repair.

**Vaisala, Inc.**
10-D Gill Street
Woburn, MA 01801
Toll Free: 888-VAISALA (824-7252)
Tel: 781-933-4500
Fax: 781 933-8029

**Customer Service**
Toll Free: 1-800-408-9454
Email: us-customerservice@vaisala.com

**Technical Support**
Toll Free: 1-800-408-9456
Email: us-technicalsupport@vaisala.com

VAISALA www.vaisala.com

# DMT132 Dewpoint Transmitter for Refrigerant Dryers

*The optional LED warning light tells the user when the defined dew point limit has been exceeded.*

## Features / Benefits

- Affordable dew point transmitter for refrigerator dryers
- High accuracy ±1°C (±1.8°F) in the measurement range of refrigerator dryers
- Excellent long-term stability - resistant to compressor oil and most other chemicals thanks to HUMICAP® technology
- Low power requirements, 10 .... 28 VDC
- Easy to verify functionality with compatible hand-held meters DM70 or HM70
- Optional LED warning light

The Vaisala HUMICAP® Dewpoint Transmitter DMT132 is an affordable dew point measurement instrument designed to verify the functionality of refrigerant dryers. It is especially well suited for OEM dryer manufacturers.

## Direct measurement cuts costs

Direct outlet air dew point measurement provides accurate information about dryer functionality and is more reliable than the traditional method of measuring refrigerator temperature only. Knowledge of the real dew point ensures high quality compressed air at all times and enables customers to optimize dryer capacity. This helps to prevent investment in redundant dryer capacity and avoid unnecessary maintenance and costly malfunctions.

## High accuracy and long-term stability

The DMT132 provides optimal performance in the operating range of refrigerant dryers. In the measurement range of -3… 20°C (+26.6…+68°F), where the refrigerator dryers typically operate, the Td accuracy is ±1°C (±1.8°F). The instrument incorporates the proven Vaisala HUMICAP® sensor, which is resistant to compressor oil and most other chemicals, thereby providing excellent long-term stability.

## Quick installation and easy field checking

It takes just a few minutes to install the DMT132 directly into a dryer or compressed air line through a G1/2" ISO thread. Vaisala sampling cells can also be used. The loop-powered electronics mean that wiring is easy and power requirements are low. DMT132 operating voltages can be as low as 10 VDC.

Verifying the performance of the DMT132 is easy with the compatible Vaisala hand-held DM70 or HM70 meters. The user can perform possible adjustments with the Vaisala HMK15 Humidity Calibrator.

*Demand for dew point sensors to verify refrigerant dryers is increasing. Direct dew point measurement enables energy savings and improved efficiency.*

# Technical data

## Performance

DEWPOINT

| | |
|---|---|
| Measurement range | -20 ... +50 °C (-4 ... +122 °F) Td |
| Accuracy (at +20 °C (+68 °F)) | ±1 °C for -3...20 °C (+26.6 ... +68 °F) Td |
| | ±2 °C for -15...-3 °C (+5 ... +26.6 °F) Td |
| | see accuracy graph below |

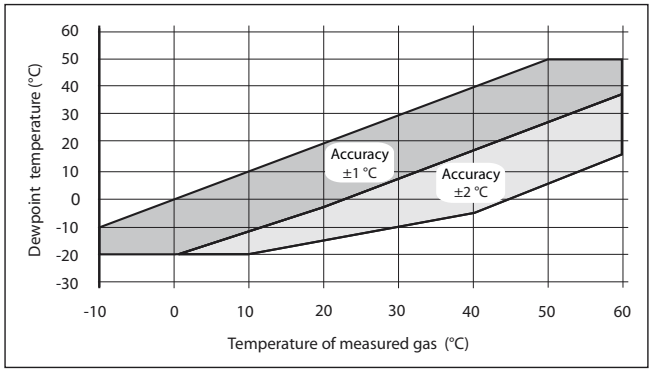
* when dewpoint is below 0 °C (+32 °F), the transmitter outputs frostpoint

Response time at 20 °C (+68 °F) gas temperature and 1 bar pressure

| | |
|---|---|
| -20 -> +50 °C (-4 -> +122 °F) Td | 17 s (63%) |
| | 40 s (90%) |
| +50 -> -20 °C (+122 -> -4 °F) Td | 33 s (63%) |
| | 85 s (90%) |

CALCULATED VARIABLES

| | |
|---|---|
| Dewpoint converted to atmospheric pressure | Tdf atm |




## Operating environment

| | |
|---|---|
| Operating temperature | -10 ... + 60 °C (+14 ... +140 °F) |
| Operating pressure | 0 ... 20 bar |
| Relative humidity | 0 ... 100 %RH |
| Sample flow rate | no effect on measurement accuracy |
| Measured gases | non-corrosive gases |

## Outputs

| | |
|---|---|
| Analog output (scalable) | 4...20 mA, 2-wire |
| Resolution for current output | 0.002 mA |
| Accuracy of analog outputs at +20 °C | ±0.05% full scale |
| Typical temperature dependence | ±0.005% of full scale/ °C |
| Connector | 4-pin M8( (IEC 60947-5-2) |
| LED indication available for defined dewpoint limit/ error state indication | |
| RS485 serial line for service use | |

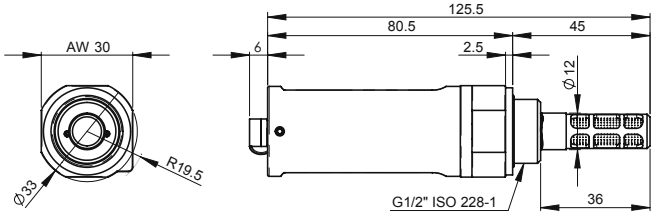
## General

| | |
|---|---|
| Sensor | Vaisala HUMICAP®180R |
| Recommended calibration interval (in refrigerant dryer application) | 2 years |
| Mechanical connection | G 1/2" ISO |
| Operating voltage | 10 .... 28 VDC |
| External load | max 100 ohm for supply voltages <20 VDC |
| | max 500 ohm for supply voltages 20...28 VDC |
| Weight | 65 g (2.3 oz) |
| Housing material | PPS + 40% GF |
| Housing classification | IP65 (NEMA 4) |
| Storage temperature range | -40 ... + 80 °C (-40 ... +176 °F) |
| Start-up time | 3 s |

Complies with EMC standard EN61326-1, Electrical equipment for measurement control and laboratory use - EMC requirements; Industrial environment

## Options and accessories

| | |
|---|---|
| Tube filter | 230602 |
| Special cover set for HMK15 (calibrator fitting DMT132 and HMP60) | 230914 |
| NPT Adapter | 210662SP |
| Sample cells | DMT242SC, DMT242SC2, DSC74, DSC74B, DSC74C, DMCOIL |
| Duct installation flange | DM240FA |
| Cables (several lengths available) | HMP50Z032, HMP50Z300SP, HMP50Z500SP, HMP50Z1000SP |
| Loop powered external display | 226476 |
| USB Service cable | 219690 |
| Connection cable to DM70/HM70 | 219980 |
| LED plug | 230388 |
| ISO" 1/2 plug | 218773 |
| NPT1/2" plug | 222507 |
| Sealing ring set (3 pcs U-seal) | 221525SP |




VAISALA

For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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CE

VAISALA

# Accredited Humidity & Temperature Calibration

### ACCREDITED HUMIDITY CALIBRATION

The relative humidity calibration is performed at room temperature using a Thunder Scientific 2500 Two-Pressure Generator. The calibration uncertainty typically ranges from ± 0.60 to ±1.1 %RH. A one-point temperature calibration is performed at ambient. The calibration procedure used for calibrations is 11603108-CSL Humidity Calibration.

Thunder Scientific 2500 Two-Pressure Generator saturates a continuous stream of gas with water vapor at a known pressure and temperature, and passes it through an expansion valve where it expands to a lower pressure.

### ACCREDITED TEMPERATURE CALIBRATION

The temperature calibration is made using Hart Scientific liquid bath with a Black Stack reference. The calibration uncertainty is typically ±0.02 °C. The calibration procedure used for calibration is 11603135-CSL Temperature Calibration.

Hart Scientific liquid baths are used as the calibration method. A Hart Scientific Black Stack/PRT combination is used as the reference standard. The Black Stack uses a high accuracy display module, model 1560 as the readout indicator. The PRT is immersed in the liquid of the bath.

### CALIBRATION DETAILS

The instrument will be adjusted to comply with its specifications (if needed) unless no adjustment is requested. Out of tolerance conditions are determined by the product specification only. The calibration

A2LA ACCREDITED

Calibration Laboratory Certificate #: 2083.01
ISO/IEC 17025:2005

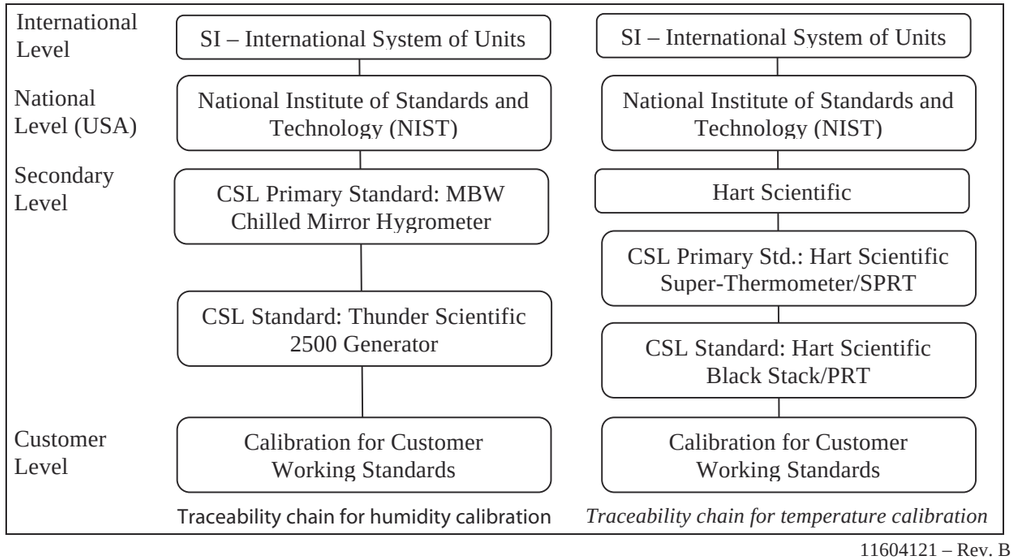
### CALIBRATION DETAILS CONTINUED

uncertainty is not tied in with the instrument's accuracy. All results are reported in a calibration certificate, which is written according to the ISO/IEC 17025:2005 standard.

### ACCREDITATION

Accreditation is a third party formal recognition that a laboratory is competent to carry out specific calibrations.

The American Association for Laboratory Accreditation (A2LA) has assessed Vaisala's Calibration Standards Laboratory (CSL) for humidity and temperature calibrations. The accreditation standard used is ISO/IEC 17025:2005. A2LA accreditation is recognized by all the major international accreditation organizations.


International Level
SI – International System of Units
National Level (USA)
National Institute of Standards and Technology (NIST)
Secondary Level
CSL Primary Standard: MBW Chilled Mirror Hygrometer
CSL Standard: Thunder Scientific 2500 Generator
Customer Level
Calibration for Customer Working Standards
Traceability chain for humidity calibration
SI – International System of Units
National Institute of Standards and Technology (NIST)
Hart Scientific
CSL Primary Std.: Hart Scientific Super-Thermometer/SPRT
CSL Standard: Hart Scientific Black Stack/PRT
Calibration for Customer Working Standards
Traceability chain for temperature calibration



VAISALA

# Accredited Humidity & Temperature Calibration

**Ordering a calibration that complies with the requirements of ISO/IEC 17025:2005**
Calibration for Vaisala humidity and temperature transmitters and probes can easily be ordered using this form. Please read the form and notes carefully and complete the form accurately to ensure correct calibration service. The form must be completed in full before calibration services can start. Include the form with your instrument. For additional information please contact Vaisala at 1-800-408-9454.

| **Instrument Details** | | | | | |
|---|---|---|---|---|---|
| Customer Name: | | | | | |
| Model No(s): | | | | | |
| Serial No(s): | | | | | |
| **Calibration Details** | | | | | **Price** |
| **Humidity Calibration** Performed at ambient temperature. Includes 1-point ambient temperature calibration. Extra points are $95 each (example: 7 points = $545). Please specify custom points below. | | | | | |
| 0 Points | No Humidity Calibration | A | | | $0.00 |
| 4 Points | 0, 11, 50, and 80 %RH | B | | | $325.00 |
| 6 Points | 0, 11, 30, 50, 70, and 90 %RH | C | | | $450.00 |
| 8 Points | 0, 11, 30, 50, 60, 70, 80, and 90 %RH | D | | | $600.00 |
| 10 Points | 0, 11, 30, 40, 50, 60, 70, 80, 90, and 95 %RH | E | | | $750.00 |
| **Temperature Calibration - Specify Points Below** Test points must be between -80 °C and 180 °C and within the model's measurement range. | | | | | |
| 0 Points | No Temperature Calibration | A | | | $0.00 |
| 3 Points | 1_____ 2_____ 3_____ °C / °F | B | | | $225.00 |
| 5 Points | 1_____ 2_____ 3_____ 4_____ 5_____ °C / °F | C | | | $350.00 |
| 7 Points | 1_____ 2_____ 3_____ 4_____ 5_____ 6_____ 7_____ °C / °F | D | | | $450.00 |
| 9 Points | 1_____ 2_____ 3_____ 4_____ 5_____ 6_____ 7_____ 8_____ 9_____ °C / °F | E | | | $550.00 |
| **Units of Results Reported** | | | | | |
| Humidity %RH, Temperature °C | | A | | | $0.00 |
| Humidity %RH, Temperature °F | | B | | | $0.00 |
| **Adjustment** Calibration prices include adjustment (if needed). Check here if you **DO NOT** want your instrument adjusted. ☐ | | | | | |
| **Customer Information To Appear On Certificate** | | | | | |
| Company Name (if different than above): | | | | | |
| Address: | | | | | |
| Requested Due Date For Next Calibration: | | | | | |
| Customer Asset #: | | | | | |
| **Received And Accepted At Vaisala** | | | | | |
| Name & Date: | | | Contract #: | | |

NOTE: The calibration prices include a Calibration Certificate, but do not reflect repair charges.
Repair charges will utilize fixed pricing: Analog repairs: $125.00, Digital repairs: $350.00

VAISALA

# Accredited Dewpoint Calibration

## ACCREDITED DEWPOINT CALIBRATION

The dewpoint calibration is made using a Thunder Scientific 3900 Two-Pressure Generator at room temperature. The calibration uncertainty is typically from 0.2 °C. A one-point temperature calibration is performed at ambient. The calibration procedure used for calibration is 11603134-CSL Dewpoint Calibration.

The Thunder Scientific 3900 Two-Pressure Two-Temperature Generator saturates a continuous stream of air or nitrogen with water vapor at a known pressure and temperature. The saturated high-pressure gas then passes through an expansion valve where it expands to a lower pressure. To generate a particular humidity the 3900 first selects a suitable saturation temperature. It then determines the saturation pressure required to establish the correct saturation vapor pressure.

## CALIBRATION DETAILS

The instrument will be adjusted to comply with its specifications (if needed) unless no adjustment is requested. Out of tolerance conditions are determined by the product specification only. The calibration uncertainty is not tied in with the instrument's accuracy. All results are reported in a calibration certificate, which is written according to the ISO/IEC 17025:2005 standard.

ACCREDITED

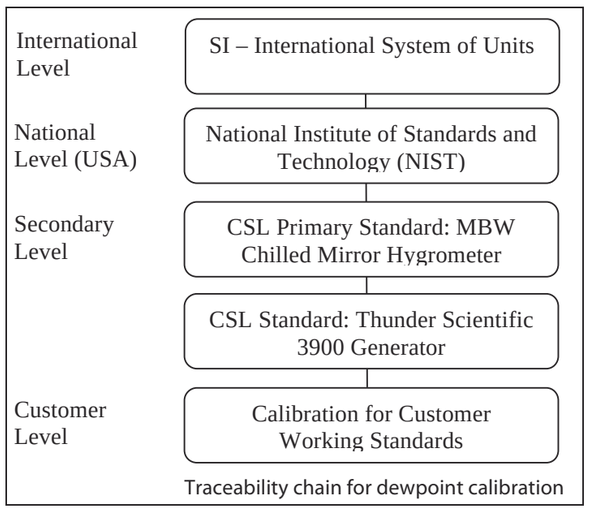
Calibration Laboratory Certificate #: 2083.01
ISO/IEC 17025:2005

## ACCREDITATION

Accreditation is a third party formal recognition that a laboratory is competent to carry out specific calibrations.

The American Association for Laboratory Accreditation (A2LA) has assessed Vaisala's Calibration Standards Laboratory (CSL) for humidity and temperature calibrations. The accreditation standard used is ISO/IEC 17025:2005.

A2LA accreditation is recognized by all the major international accreditation organizations.


International Level
SI – International System of Units
National Level (USA)
National Institute of Standards and Technology (NIST)
Secondary Level
CSL Primary Standard: MBW Chilled Mirror Hygrometer
CSL Standard: Thunder Scientific 3900 Generator
Customer Level
Calibration for Customer Working Standards
Traceability chain for dewpoint calibration



VAISALA

# Accredited Dewpoint Calibration

**Ordering a calibration that complies with the requirements of ISO/IEC 17025:2005**
Calibration for Vaisala humidity and temperature transmitters and probes can easily be ordered using this form. Please read the form and notes carefully and complete the form accurately to ensure correct calibration service. The form must be completed in full before calibration services can start. Include the form with your instrument. For additional information please contact Vaisala at 1-800-408-9454.

| **Instrument Details** | | | |
|---|---|---|---|
| Customer Name: | | | |
| Model No(s): | | | |
| Serial No(s): | | | |
| **Calibration Details** | | | **Price** |
| **Dewpoint Calibration - Specify Points Below**<br>Dewpoint points must be between -60 °C and -10 °C and within the model's measurement range. | | | |
| 3 Points 1:_____ 2:_____ 3:_____ | A | | $500.00 |
| 4 Points 1:_____ 2:_____ 3:_____ 4:_____ | B | | $625.00 |
| 5 Points 1:_____ 2:_____ 3:_____ 4:_____ 5:_____ | C | | $750.00 |
| **Units of Results Reported** | | | |
| Humidity %RH, Temperature °C | A | | $0.00 |
| Humidity %RH, Temperature °F | B | | $0.00 |
| **Adjustment** | | | |
| Calibration prices include adjustment (if needed). Check here if you **DO NOT** want your instrument adjusted. ☐ | | | |
| **Customer Information To Appear On Certificate** | | | |
| Company Name (if different than above): | | | |
| Address: | | | |
| | | | |
| | | | |
| Requested Due Date For Next Calibration: | | | |
| Customer Asset #: | | | |
| **Received And Accepted At Vaisala** | | | |
| Name & Date: | | Contract #: | |

NOTE: The calibration prices include a Calibration Certificate, but do not reflect repair charges.
Repair charges will utilize fixed pricing: Analog repairs: $125.00, Digital repairs: $350.00

# Vaisala Filters

## Group A: 12 mm Diameter, Standard Length, Female Threads

0195

0195
Brass, sintered filter, 133 microns, ø 12.0 mm
Use with: HMM20/30, HMP130,HMP36, HMP46
Group: A

10159HM

10159HM
Membrane filter, 0.2 microns, ø 12.0 mm
Use with: HMD20/30, HMM20/30, HMP133, HMP75, HMM100
Group: A

6221

6221
Plastic grid, 2 mm protection, ø 12.0 mm
Use with: HM34, HMD20/30,HMM20/30,HMP133, HMP75, HMM100
Group: A

## Group B: 12 mm Diameter, Long Length, Female Threads (Could be used in place of "A" type filters)

DRW010276SP

DRW010276SP
PPS plastic grid filter, 6.5 mm, ø 12 mm
Use with: DTS1, HMT330, HMP76/77, MMT310
Group: B

HM47280SP

HM47280SP
Stainless steel sintered filter , 38 µm, ø 12mm
Use with: HMT330, HMP76/77, DM70, DMT242, DMP74, DMT142,HMM20/30, MMT310, DMT340, HMM100
Group: B

DRW010281SP

DRW010281SP
PPS plastic grid with stainless steel nettng, 15 µm, ø 12 mm
Use with: DTS1, HMT330, HMP76/77, MMT310
Group: B

HM47453SP

HM47453SP
Stainless steel filter guard for vacuum, 3.15 mm, ø 12 mm
Use with: DM70, DMT242, HMP228, DMT340, HMT310, MM70, MMT310, DMT142, MMT330
Group: B

DRW212987SP

DRW212987SP
Sintered filter, 40 µm, ø 12 mm
Use with: HMP76/77, HMP75
Group: B

219452SP

219452SP
Sintered PTFE filter, ø 12 mm
Use with: HMP155, HMM100
Group: B



# Vaisala Filters continued

## Group C: 12 mm Diameter, Male Threads

17039HM

17039HM
Membrane filter 0.2 µm, ø 12 mm
Use with: HMD60/70/40/50 HMP44, HMP141/143
Group: C

DRW010522

DRW010522
Plastic Grid, 2 mm, ø 12 mm
Use with: HMP50, HMT100
Group: C

HMM46670SP

HM46670SP
Sintered stainless steel filter , 38 µm, ø 12.0 mm
Use with: HMP50, HMM210, HMT100, HMD60/70
Group: C

DRW010525

DRW010525
Membrane filter, 0.2 µm, ø 12 mm
Use with: HMW61/71 Internal HMD60/70, HMP50, HMT100
Group: C

## Group D: 13.5 mm Diameter, Male Threads

16452SP

16452SP
Sintered filter, stainless steel, 37 microns, ø 13.5 mm
Use with: DMP248, HMP230, HMP228, HMT360
Group: D

17230HMSP

17230HMSP
PTFE membrane, 3.5 µm, ø 13.5 mm.
Use with: HMP230, HMP228, HMT360
Group: D

16562SP

16562SP
PPS Grid, 2 mm, ø 13.5 mm
Use with: HMP230, HMP37, HMP228, HMT360, PTU200
Group: D

HM46999SP

HM46999SP
Sintered stainless steel filter, 2mm, ø 13.5
Use with: DMP248, HMT360, HMP237
Group: D

16720HMSP

16720HMSP
PPS Grid and stainless steel net, 14 µm, ø 13.5 mm
Use with: HMP230, HMT360, HMP37E
Group: D

# Vaisala Filters continued

## Group E: 18.5 mm Diameter, Female Threads

6597

6597
Plastic grid, 2.5 mm, ø 18.5 mm
Use with: HMM30N,HMP131, HMP35, HMP45A/D
Group: E

2787HM

2787HM
Membrane filter, 0.2 microns, ø 18.5 mm
Use with: HMM30, HMP35,HMP45,PTU200, HMW21/31
Group: E

HM46717

HM46717
Plastic grid, 2.5 mm, ø 18.5 mm
Use with: HMP41, HMP45
Group: E

16126HM

16126HM
Metallized membrane filter, 0.5 µm, ø 18.5 mm
Use with: HMP35
Group: E



HM47329

HM47329
Probe cap, ø 18.5 mm (protective cap)
Use with: HMT100

## Stand Alone - Not Interchangeable:

HM46780

HM46780
Stainless steel filter, 38 µm, ø 20 mm
Use with: DMP246CS - External

19858HM Membrane filter tube set (5 pcs)
HMP42 aprobe,
0.2 µm, ø 4mm

19867HM Steel grid for the HMP42 probe,
1 mm, ø 4 mm



# Order Guides

**HMT331 Humidity and Temperature Transmitter**
**For wall mounting**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | |
| | **Vaisala HUMICAP® Humidity and Temperature Transmitter** | | | | | | | | | | | | | | | | | | | | | | | | | | | **HMT330** | **1** | **A** | **0** | | | | | | | | | | | | | | | | | | **A** | **1** | **PRICE** |
| 1 | **Transmitter type** | | | | | | | | | | | | | | | | | | | | | | | | | | | **HMT331** | **1** | | | | | | | | | | | | | | | | | | | | | | $1,120 |
| 2 | **Cable length** | | | | | | | | | | | | | | | | | | | | | | | | | | | **Wall probe fixed** | | | **A** | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **with short cable** *Probe holder plate recommended in selection 16* | | | **8** | | | | | | | | | | | | | | | | | | | | | |
| 3 | **No additional temperature probe** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | | | | | | | | | | | | | | | | | | | | |
| 4 | **Parameters** | | | | | | | | | | | | | | | | | | | | | | | | | | | **RH+T** | | | | | | | | | | | | | | | | | | | | | | **A** | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *RH+T+Td+Tdf+a+x+Tw+ppm+pw+pws+h+dT* | | | | | | | | | | | | | | | | | | | | | | *B* | | | $360 |
| 5 | **Display** | | | | | | | | | | | | | | | | | | | | | | | | | | | **No display** | | | | | | | | | | | | | | | | | | | | | **0** | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Graphic display with keypad* | | | | | | | | | | | | | | | | | | | | | *1* | | | $320 |
| 6 | **Power supply** | | | | | | | | | | | | | | | | | | | | | | | | | | | **10...35 VDC , 24 VAC** | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Galvanic isolation for outputs 10...35 VDC, 24 VAC* | | | | | | | | | | | | | | | | | | | | | | | 1 | | $80 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Universal AC -power (100....240 VAC)* | | | | | | | | | | | | | | | | | | | | | | | 2 | | $200 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Universal AC -power (100....240 VAC) + US power cord* | | | | | | | | | | | | | | | | | | | | | | | 3 | | $210 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *External US AC-adapter (for LAN/WLAN interface in USA and Canada)* | | | | | | | | | | | | | | | | | | | | | | | 9 | | $60 |
| 7 | **Analog Output Signal** | | | | | | | | | | | | | | | | | | | | | | | | | | | **4... 20 mA** | | | | | | | | | | | | | | | | | | | | | | | **1** | | |
| | **for Ch1&Ch2(&Ch3)** | | | | | | | | | | | | | | | | | | | | | | | | | | | **0... 20 mA** | | | | | | | | | | | | | | | | | | | | | | | **2** | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0... 1 V** | | | | | | | | | | | | | | | | | | | | | | | **3** | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0... 5 V** | | | | | | | | | | | | | | | | | | | | | | | **4** | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0... 10 V** | | | | | | | | | | | | | | | | | | | | | | | **5** | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **+ Serial interface RS232 or optional communication module** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **Analog output signals** | | | | | | | | | | | | | | | | | | | | | | | | | | | **No 3rd analog output** | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | **for Ch1 , Ch2 and Ch3** | | | | | | | | | | | | | | | | | | | | | | | | | | | **RH** | | | | | | | | | | | **(0...100%RH)** | | | | | | | | | | RH=relative humidity | | | **B** | **B** | **B** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **T** | | | | | | | | | | | **(range: see below)** | | | | | | | | | | T=temperature | | | **C** | **C** | **C** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Td (-20...100°C)** | | | | | | | | | | | **(-4...+212 °F)** | | | | | | | | | | Td=dewpoint | | | **D** | **D** | **D** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Tdf (-20...100°C)** | | | | | | | | | | | **(-4...+212 °F)** | | | | | | | | | | Tdf = dewpoint/ frost point temperature | | | **E** | **E** | **E** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **a (0...600g/m3)** | | | | | | | | | | | **(0...262 gr/ft3)** | | | | | | | | | | a=absolute humidity | | | **F** | **F** | **F** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Tw (0...100°C)** | | | | | | | | | | | **(+32...+212°F)** | | | | | | | | | | Tw=wet bulb temperature | | | **G** | **G** | **G** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **x (0...500g/kg d.a)** | | | | | | | | | | | **(0...3500gr/lb)** | | | | | | | | | | x=mixing ratio | | | **H** | **H** | **H** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **h (-40...1500 kJ/kg)** | | | | | | | | | | | **(-9.5...+652.6 Btu/lb)** | | | | | | | | | | h=enthalpy | | | **J** | **J** | **J** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **ppm (0…5000)** | | | | | | | | | | | **(0…5000)** | | | | | | | | | | ppm=parts per million | | | **K** | **K** | **K** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **pw (0…1000 hPa)** | | | | | | | | | | | **(0…14.5psi)** | | | | | | | | | | pw=water vapor pressure | | | **L** | **L** | **L** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **pws (0…1000 hPa)** | | | | | | | | | | | **(0…14.5psi)** | | | | | | | | | | pws=saturation water vapor pressure | | | **M** | **M** | **M** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **dT (-10...+50 °C)** | | | | | | | | | | | **(14...+122 °F)** | | | | | | | | | | dT=(temperature-dewpoint temperature) | | | **N** | **N** | **N** |
| | **SPECIAL** | | **Define quantity** | | | | | | | | | | | | | | | | | | | | | | | | | **Ch1:**_____ | | | | | | | | | | | **Ch2:**_____ | | | | | | | | | | **Optional Ch3:**_____ | | | **X** | **X** | **X** |
| | | | **Define scale** | | | | | | | | | | | | | | | | | | | | | | | | | **Ch1:**_____ | | | | | | | | | | | **Ch2:**_____ | | | | | | | | | | **Optional Ch3:**_____ | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | Channel 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | Channel 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | Channel 3, choose A if not needed | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Analog output range** | | | | | | | | | | | | | | | | | | | | | | | | | | | **No temperature output** | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | **for temperature** | | | | | | | | | | | | | | | | | | | | | | | | | | | **-40...+60°C** | | | | | | | | | | | **(-40...+140°F)** | | | | | | | | | | | | | **B** | |
| | **Note:** | | | | | | | | | | | | | | | | | | | | | | | | | | | **-20...+60°C** | | | | | | | | | | | **(-4...+140°F)** | | | | | | | | | | | | | **F** | |
| | **- Choose option A, if no** | | | | | | | | | | | | | | | | | | | | | | | | | | | **0...+60°C** | | | | | | | | | | | **(+32...+140°F)** | | | | | | | | | | | | | **K** | |
| | **T output is desired** | | | | | | | | | | | | | | | | | | | | | | | | | | | **Special** | | | | | | | | | | | **:**_____ | | | | | | | | | | | | | **X** | |
| 12 | **Output units** | | | | | | | | | | | | | | | | | | | | | | | | | | | **Metric** | | | | | | | | | | | | | | | | | | | | | | | | | **1** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Non-metric** | | | | | | | | | | | | | | | | | | | | | | | | | **2** | |
| 13 | **Option for module slot 1** | | | | | | | | | | | | | | | | | | | | | | | | | | | **No module** | | | | | | | | | | | | | | | | | | | | | | | | | | **0** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Relay output* | | | | | | | | | | | | | | | | | | | | | | (Relay-1) | | | 1 | $180 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *RS-485 serial interface (galvanically isolated)* | | | | | | | | | | | | | | | | | | | | | | (RS485-1) | | | 2 | $160 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *LAN (Ethernet) interface + 2 m cable (RJ45)* | | | | | | | | | | | | | | | | | | | | | | Not with universal AC power | | | 4 | $260 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *WLAN (Wireless Ethernet) interface + antenna* | | | | | | | | | | | | | | | | | | | | | | with short cable probe only | | | 5 | $320 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Data logger module* | | | | | | | | | | | | | | | | | | | | | | | | | 6 | $350 |
| 14 | **Option for module slot 2** | | | | | | | | | | | | | | | | | | | | | | | | | | | **No module** | | | | | | | | | | | | | | | | | | | | | | | | | **0** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Relay output* | | | | | | | | | | | | | | | | | | | | | | (Relay-1) | | | 1 | $180 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *3rd Analog output* | | | | | | | | | | | *Choose also analog output signal for Ch3* | | | | | | | | | | (AOUT-1) | | | 3 | $160 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Data logger module* | | | | | | | | | | | *Not possible if the data logger module has already been chosen in item 11* | | | | | | | | | | | | | 6 | $350 |
| 15 | **Cable bushings** | | | | | | | | | | | | | | | | | | | | | | | | | | | **Cable gland (for 8...11mm cable)** | | | | | | | | | | | **(for 0.315...0.433 inch cable)** | | | | | | | | | | (214728SP) | | | **A** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Conduit fitting for wire conduit (NPT1/2")** | | | | | | | | | | | | | | | | | | | | | | (214780SP) | | | **B** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *8-pole connector with 5 m cable (not possible with universal AC power option)* | | | | | | | | | | | | | | | | | | | | | | (212142) | | | *C* | $60 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *8-pole counter connector equipped with screw terminals (not possible with universal AC power option)* | | | | | | | | | | | | | | | | | | | | | | (212416) | | | *D* | $60 |
| 16 | **Transmitter installation** | | | | | | | | | | | | | | | | | | | | | | | | | | | **Standard wall mounting** | | | | | | | | | | | | | | | | | | | | | | | | | | **0** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Adapter plate (for replacing the HMP230's)* | | | | | | | | | | | | | | | | | | | | | | (214829) | | | 1 | $90 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Pole installation kit* | | | | | | | | | | | | | | | | | | | | | | (215108) | | | 2 | $100 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *DIN rail kit* | | | | | | | | | | | | | | | | | | | | | | (215094) | | | 4 | $90 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Probe holder plate* | | | | | | | | | | | *Recommended with short cable probe* | | | | | | | | | | (226252) | | | 5 | $90 |
| 17 | **Humidity sensor type** | | | | | | | | | | | | | | | | | | | | | | | | | | | **General purpose** | | | | | | | | | | | | | | | | | | | | | | **HUMICAP180** | | | **1** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Chemical purge* | | | | | | | | | | | | | | | | | | | | | | *HUMICAP180C* | | | 4 | $60 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | **General purpose and high chemical concentrations** | | | | | | | | | | | | | | | | | | | | | | **HUMICAP180R** | | | **A** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Chemical purge* | | | | | | | | | | | | | | | | | | | | | | *HUMICAP180RC* | | | *C* | $60 |
| 18 | **Sensor protection** | | | | | | | | | | | | | | | | | | | | | | | | | | | *PPS plastic grid & stainless steel netting* | | | | | | | | | | | | | | | | | | | | | | (DRW010281SP) | | | *A* | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *PPS plastic grid* | | | | | | | | | | | | | | | | | | | | | | (DRW010276SP) | | | *B* | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Sintered stainless steel filter* | | | | | | | | | | | | | | | | | | | | | | (HM47280SP) | | | *C* | |
| 19 | **No probe installation kit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| 20 | **Operating manual** | | | | | | | | | | | | | | | | | | | | | | | | | | | **No manual** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** |
| | **language** | | | | | | | | | | | | | | | | | | | | | | | | | | | **English** | | | | | | | | | | | | | | | | | | | | | | (M210566EN) | | | | **B** |
| 21 | **PC Accessories** | | | | | | | | | | | | | | | | | | | | | | | | | | | **No** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Service cable for PC, RS232* | | | | | | | | | | | | | | | | | | | | | | (19446ZZ) | | | *B* | $40 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *MI70LINK software for Windows® with RS232 service cable* | | | | | | | | | | | | | | | | | | | | | | (215005) | | | *C* | $60 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *Service cable for PC, USB with software driver* | | | | | | | | | | | | | | | | | | | | | | (219685) | | | *D* | $90 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | *MI70LINK software for Windows® with USB service cable* | | | | | | | | | | | | | | | | | | | | | | (219916) | | | *E* | $90 |
| 22 | **Calibration** | | | | | | | | | | | | | | | | | | | | | | | | | | | **ISO9001 compliant calibration with NIST traceable certificate** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| 23 | **For future use** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1** | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

**Example of order code with typical settings:**

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HMT330** | **1** | **A** | **0** | **A** | **1** | **0** | **1** | **B** | **C** | **A** | **B** | **2** | **0** | **0** | **A** | **0** | **A** | **A** | **A** | **B** | **A** | **A** | **1** |

## HMT333 Humidity and Temperature Transmitter

**For general use**

| | | |

## HMT335 Humidity and Temperature Transmitter

**For high temperatures**

| | | |

## HMT337 Humidity and Temperature Transmitter with warmed probe

**For high humidities**

| | | |

## Vaisala Meteorological Installation Kit for HMT330 Transmitters

| | | | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|---|---|
| | **Vaisala Meteorological Installation Kit** | **HMT330MIK** | | | | | | PRICE |
| 1 | Support bar & shield for warmed Td probe | **No support bar & shield for warmed Td probe** | | | **0** | | | |
| | | *Support bar, transmitter mounting plate & shield for warmed Td probe* | | | *1* | | | $580 |
| 2 | Support bar and radiation shield for | **No support bar or radiation shield** | | | **A** | | | |
| | additional T probe or for | *Support bar with DTR502 shield for T probe* | | | *B* | | | $580 |
| | non-warmed RH or Td probe | *Support bar with DTR13 shield for T probe* | | | *C* | | | $920 |
| | | *Support bar with DTR502 shield for non-warmed RH or Td probe* | | | *D* | | | $580 |
| | | *Support bar with DTR13 shield for non-warmed RH or Td probe* | | | *E* | | | $920 |
| 3 | Support bar mounting plate | **No mounting plate** | | | | **0** | | |
| | | *Pole mounting plate for support bar/bars* | | | | *1* | | $120 |
| 4 | Additional transmitter mounting plate | **No additional transmitter mounting plate** | | | | | **A** | |
| | | *Transmitter mounting plate for support bar assembly* | | | | | *B* | $110 |
| | | *Transmitter mounting plate for pole assembly* | | | | | *C* | $110 |
| 5 | Static Pressure Head | **No Static Pressure Head** | | | | | | **0** |
| | | *Static Pressure Head SPH10* | | | | | | *1* $270 |

Selections in **bold** are included in the prices of the basic versions. TOTAL
*Selections in italic have an additional cost* QTY
Shaded sections indicate typical selections. TOTAL VALUE

Example of order code with typical settings:

| HMT330MIK | 1 | B | 1 | A | 1 |
|---|---|---|---|---|---|



## HMP155 Humidity and Temperature Probe

**with voltage or RS485 output for temperature**

| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Humidity and Temperature Probe** | | **HMP155** | | | | | | | | | **A** | | | **1** | | | **A** | PRICE |
| 1 | **Probe type** | **2 x voltage output (RS485 for service use)** | | | | | | | | | | **A** | | | | | | | $640 |
| | | **RS485 serial output** | | | | | | | | | | **E** | | | | | | | |
| 2 | **Signal output selection** | **RS485 serial output (only for probe type E)** | | | | | | | | | **1** | | | | | | | | |
| | | **0…1 V output** | | | | | | | | | **2** | | | | | | | | |
| | | **0…5 V output** | | | | | | | | | **3** | | | | | | | | |
| | | **0…10 V output** | | | | | | | | | 4 | | | | | | | | |
| 3 | **Analog output signal for CH1** | **None (RS485 output used)** | | | | | | | | | | **A** | | | | | | | |
| | **Choose option A, if No T output** | **T (-40…+60°C)** | **T (-40…+140°F)** | | | | | | | | | **G** | | | | | | | |
| | **is desired, or output is RS485** | **T (-80…+60°C)** | **T (-112…+140°F)** | | | | | | | | | **J** | | | | | | | |
| 4 | **Analog output signal for CH2** | **None (RS485 output used)** | | | | | | | | | | **A** | | | | | | | |
| | **Choose option A if output is RS485** | **RH** | **(0…100%RH)** | | | | | | | | | **B** | | | | | | | |
| | | **Td (-60…+60°C)** | **T (-76…+140°F)** | | | | | | | | | **C** | | | | | | | |
| | | **Tdf (-60…+60°C)** | **T (-76…+140°F)** | | | | | | | | | **D** | | | | | | | |
| | | **Tw (0…+60°C)** | **T (+32…+140°F)** | | | | | | | | | **E** | | | | | | | |
| | | **x (0…200g/kg d.a)** | **(0…1400 gr/lb)** | | | | | | | | | **F** | | | | | | | |
| 5 | **Units** | **Metric** | | | | | | | | **1** | | | | | | | | | |
| | | **Non Metric** | | | | | | | | **2** | | | | | | | | | |
| 6 | **Humidity Sensor Type** | **General purpose** | **HUMICAP180R** | | | | | | **1** | | | | | | | | | | $60 |
| | | Composite sensor | *HUMICAP180RC* | | | | | | *2* | | | | | | | | | | |
| | | **General purpose** | **HUMICAP180** | | | | | | **3** | | | | | | | | | | $60 |
| | | Composite sensor | *HUMICAP180C* | | | | | | *4* | | | | | | | | | | |
| 7 | **Heating options** | **None** | | | | | | | | | **A** | | | | | | | | |
| | See(*) Note below | *Warmed probe (only with composite sensor)* | *RH&T outputs only with Additional Temperature probe* | | | | | | | | *B* | | | | | | | | $280 |
| | | *Warmed probe with Xheat (only with composite sensor)* | *RH&T outputs only with Additional Temperature probe* | | | | | | | | *C* | | | | | | | | $280 |
| 8 | **Chemical purge** | **None** | | | | | | | | | **0** | | | | | | | | |
| | | **Periodical (only with composite sensor)** | | | | | | | | | **1** | | | | | | | | |
| | | **Start-up (only with composite sensor)** | | | | | | | | | **2** | | | | | | | | |
| | | **Both periodical & start-up (only with composite sensor)** | | | | | | | | | **3** | | | | | | | | |
| 9 | **Sensor protection** | **Sintered Teflon filter** | | | | | | | | | | **A** | | | | | | | |
| 10 | **Probe cable length** | **No cable (no counter connector)** | | | | | | | | | | | **0** | | | | | | |
| | | *3.5 meter (with 8 pin M12 female connector)* | | | | | | | | | | | *1* | | | | | | $30 |
| | | *10 meter (with 8 pin M12 female connector)* | | | | | | | | | | | *2* | | | | | | $50 |
| | | *30 meter (with 8 pin M12 female connector)* | | | | | | | | | | | *3* | | | | | | $80 |
| 11 | **Additional Temperature probe** | **None** | | | | | | | | | | | | **A** | | | | | |
| | | *Additional T-probe with 2 m cable* | | | | | | | | | | | | *B* | | | | | $160 |
| 12 | **Calibration** | **At room temperature** | | | | | | | | | | | | | **1** | | | | |
| 13 | **PC-Accessories** | **None** | | | | | | | | | | | | | | **A** | | | |
| | | *PC connection cable (USB)* | *Item: 221040* | | | | | | | | | | | | | *B* | | | $90 |
| | | *MI70 connection cable* | *Item: 221801* | | | | | | | | | | | | | *C* | | | $60 |
| | | *PC connection cable (USB) & MI70 connection cable* | *Item: 222303* | | | | | | | | | | | | | *D* | | | $150 |
| 14 | **Installation accessories** | **None** | | | | | | | | | | | | | | | **0** | | |
| | | *Installation kit to Stevenson screen* | *Item: 221321* | | | | | | | | | | | | | | *1* | | $95 |
| | | *Additional T-probe installation part to DTR502* | *Item: 221072* | | | | | | | | | | | | | | *2* | | $60 |
| | | *Additional T-probe installation part to DTR13* | *Item: 221069* | | | | | | | | | | | | | | *3* | | $80 |
| 15 | **(For production use only)** | | | | | | | | | | | | | | | | | **A** | |

**(*) NOTE:** If warmed probe is chosen and additional temperature sensor is not used
output signal for Ch1 must be 'None' and for Ch2 only Td, Tdf or x output can be selected.

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

**Example of order code with typical settings:**

| HMP155 | A | 2 | G | B | 2 | 1 | A | 0 | A | 1 | A | 1 | A | 0 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| **Acessories and Spare Parts:** | **Description:** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Connection cable 3.5 m - 8-pin M12 | 220496 | $30 |
| | Connection cable 10 m - 8-pin M12 | 220497 | $50 |
| | Connection cable 30 m - 8-pin M12 | 220498 | $80 |
| | Sintered Teflon filter + O-ring | 219452SP | $50 |
| | Protection Set for Calibration Buttons | 221318 | $15 |
| | Solar shield for humidity probe | DTR503A | $310 |
| | Solar shield for additional temperature probe | DTR502B | $310 |

## HMP155 Humidity and Temperature Probe

**with resistive 4-wire output for temperature**

| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Humidity and Temperature Probe** | | **HMP155** | **D** | | **A** | **B** | | | **A** | **0** | **A** | | **A** | **1** | | | **A** | |
| 1 | **Probe type** | **Voltage output for RH (RS485 for service use), 4-wire Pt100 output for Temperature** | | **D** | | | | | | | | | | | | | | | $600 |
| 2 | **Signal output selection** | **0…1 V output** | | **2** | | | | | | | | | | | | | | | |
| | | **0…5 V output** | | **3** | | | | | | | | | | | | | | | |
| | | **0…10 V output** | | *4* | | | | | | | | | | | | | | | |
| 3 | **Analog output signal for CH1** | **None (4-wire PT100 output used)** | | | | | **A** | | | | | | | | | | | | |
| 4 | **Analog output signal for CH2** | **RH** | **(0…100%RH)** | | | | | **B** | | | | | | | | | | | |
| 5 | **Units** | **Metric** | | | | | | | **1** | | | | | | | | | | |
| | | **Non Metric** | | | | | | | **2** | | | | | | | | | | |
| 6 | **Humidity Sensor Type** | **General purpose** | **HUMICAP180R** | | | | | | | **1** | | | | | | | | | |
| | | **Gereral purpose** | **HUMICAP180** | | | | | | | **3** | | | | | | | | | |
| 7 | **Heating options** | **None** | | | | | | | | | **A** | | | | | | | | |
| 8 | **Chemical purge** | **None** | | | | | | | | | | **0** | | | | | | | |
| 9 | **Sensor protection** | **Sintered Teflon filter** | | | | | | | | | | | **A** | | | | | | |
| 10 | **Probe cable length** | **No cable (no counter connector)** | | | | | | | | | | | | **0** | | | | | |
| | | *3.5 meter (with 8 pin M12 female connector)* | | | | | | | | | | | | *1* | | | | | $30 |
| | | *10 meter (with 8 pin M12 female connector)* | | | | | | | | | | | | *2* | | | | | $50 |
| | | *30 meter (with 8 pin M12 female connector)* | | | | | | | | | | | | *3* | | | | | $80 |
| 11 | **Additional Temperature probe** | **None** | | | | | | | | | | | | | **A** | | | | |
| 12 | **Calibration** | **At room temperature** | | | | | | | | | | | | | | **1** | | | |
| 13 | **PC-Accessories** | **None** | | | | | | | | | | | | | | | **A** | | |
| | | *PC connection cable (USB)* | *Item: 221040* | | | | | | | | | | | | | | *B* | | $100 |
| | | *MI70 connection cable* | *Item: 221801* | | | | | | | | | | | | | | *C* | | $60 |
| | | *PC connection cable (USB) & MI70 connection cable* | *Item: 222303* | | | | | | | | | | | | | | *D* | | $160 |
| 14 | **Installation accessories** | **None** | | | | | | | | | | | | | | | | **0** | |
| | | *Installation kit to Stevenson screen* | *Item: 221321* | | | | | | | | | | | | | | | *1* | $95 |
| 15 | **(For production use only)** | | | | | | | | | | | | | | | | | | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

**Example of order code with typical settings:**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HMP155** | **D** | **2** | **A** | **B** | **2** | **1** | **A** | **0** | **A** | **1** | **A** | **1** | **A** | **0** | **A** |

| **Acessories and Spare Parts:** | **Description:** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Connection cable 3.5 m - 8-pin M12 | 220496 | $30 |
| | Connection cable 10 m - 8-pin M12 | 220497 | $50 |
| | Connection cable 30 m - 8-pin M12 | 220498 | $80 |
| | Sintered Teflon filter + O-ring | 219452SP | $50 |
| | Protection Set for Calibration Buttons | 221318 | $15 |
| | Solar shield for humidity probe | DTR503A | $310 |



## HMT361 Humidity and Temperature Transmitter

**For wall mounting**

| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Humidity and Temperature Transmitter** | | | **HMT360** | **1** | | | | | | | | | | | | | **A** | | | |
| 1 | **Transmitter type** | | | **HMT361** | **1** | | | | | | | | | | | | | | | | |
| 2 | **Parameters** | *RH+T* | | | | *A* | | | | | | | | | | | | | | | $2,120 |
| | | *RH+T+Td+a+Tw+x* | | | | *D* | | | | | | | | | | | | | | | $2,660 |
| 3 | **Display** | **No display** | | | | | **1** | | | | | | | | | | | | | | |
| | | *Display on transmitter cover* | | | | | *2* | | | | | | | | | | | | | | $120 |
| 4 | **Signal output** | **2 analog output channels (Ch1 + Ch2 4... 20 mA** | | | | | | **2** | | | | | | | | | | | | | |
| | **Parameter and scaling for analog output (Ch1 & Ch2)** | **No analog output** | | | | | | | | **A** | | | | | | | | | | | |
| | | **RH (0... 100%RH)** | | | | | | | | **B** | **B** | | | | | | | | | | |
| | | **T (choose range in next section)** | | | | | | | | **C** | **C** | | | | | | | | | | |
| | | **Td (-40…60°C)** | ***(-40... 140°F)*** | | | | | | | **D** | **D** | | | | | | | | | | |
| | | **a (0... 160g/m3)** | ***(0...70gr/ft3)*** | | | | | | | **E** | **E** | | | | | | | | | | |
| | | **Tw (0…60°C)** | ***(+32...+140°F)*** | | | | | | | **F** | **F** | | | | | | | | | | |
| | | **x (0...160g/kg d.a)** | ***(0…1120gr/lb)*** | | | | | | | **G** | **G** | | | | | | | | | | |
| | **Special:** | Define quantity for: | CH1:_____ CH2:_____ | | | | | | | **X** | **X** | | | | | | | | | | |
| | | Define scale for: | CH1:_____ CH2:_____ | | | | | | | | | | | | | | | | | | |
| | **NOTE:** | | | | | | | | | | | | | | | | | | | | |
| 5 | **- Td, a, Tw and x are only avalable with parameter selection D** | | | | | | | | | | | | | | | | | | | | |
| 6 | **- If only one analog output has been chosen, choose A for Ch2** | | | | | | | | | | | | | | | | | | | | |
| 7 | **Analog output range for temperature** | **-40...+60°C** | ***(-40...+140°F)*** | | | | | | | | | | | | | | | **A** | | | |
| | | **-20...+60°C** | ***(-4...+140°F)*** | | | | | | | | | | | | | | | **B** | | | |
| | **- If no temperature output is desired, cho** | **0...+60°C** | ***(+32...+140°F)*** | | | | | | | | | | | | | | | **C** | | | |
| | | **Special** | | | | | | | | | | | | | | | | **X** | | | |
| 8 | **Output units** | **Metric** | | | | | | | | | | | | | | | **1** | | | | |
| | | **Non-metric** | | | | | | | | | | | | | | | **2** | | | | |
| 9 | **Interface cable connection** | **Cable gland M20x1.5 for cable diameters 7.5 ... 12 mm** | | | | | | | | | | | | | | | | **A** | | | |
| | | **Conduit fitting NPT1/2"** | (for wire conduits) | | | | | | | | | | | | | | | **B** | | | |
| | | **Cable gland M20x1.5 for cable diameters 10 ... 15 mm** | | | | | | | | | | | | | | | | **C** | | | |
| 10 | **Ex certification and issuer** | **ATEX 100a 94/9/EC (PTB)** | | | | | | | | | | | | | | | | | **2** | | |
| | | **Factory Mutual (USA)** | | | | | | | | | | | | | | | | | **4** | | |
| | | **CSA (Canada)** | | | | | | | | | | | | | | | | | **5** | | |
| | | **TIIS (Japan)** | | | | | | | | | | | | | | | | | **7** | | |
| 11 | **User's guide** | **No manual** | | | | | | | | | | | | | | | | | | **A** | |
| | | **English** | | | | | | | | | | | | | | | | | | **B** | |
| 12 | **Probe and cable length** | **HMP361** | **max +60°C** | | | | | | | | | | | | | | | | | **A** | |
| 13 | **Sensor type** | **HUMICAP 180** | | | | | | | | | | | | | | | | | | | **1** |
| | | **HUMICAP 180L2** | | | | | | | | | | | | | | | | | | | **2** |
| | | **HUMICAP 180R** | | | | | | | | | | | | | | | | | | | **5** |
| 14 | **Reserved for future option** | | | | | | | | | | | | | | | | | | | **A** | |
| 15 | **Sensor protection** | **PPS plastic grid & stainless steel netting (recommended choi** | DRW0101281SP | | | | | | | | | | | | | | | | | | **1** |
| | | **PPS plastic grid** | DRW0101276SP | | | | | | | | | | | | | | | | | | **2** |
| | | **Sintered stainless steel filter** | HM47280SP | | | | | | | | | | | | | | | | | | **3** |
| | | **Stainless steel grid filter** | HM47453SP | | | | | | | | | | | | | | | | | | **4** |
| 16 | **Reserved for future option** | | | | | | | | | | | | | | | | | | | | **0** |

TOTAL
QTY
TOTAL VALUE

**Selections in bold are included in the prices of the basic versions.**
***Selections in italic are available at an extra price.***
**Shaded sections indicate typical selections.**

**Example of order code with typical settings:**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HMT360** | **1** | **A** | **2** | **2** | **B** | **C** | **A** | **2** | **A** | **4** | **B** | **A** | **5** | **A** | **1** | **0** |

RH = Relative Humidity a = Absolute Humidity g/m3
T = Temperature x = Mixing Ratio g/Kg
Td = Dewpoint Temper. Tw = Wet Bulb Temperature

**NOTE: Intrinsically Safe barriers are required with the HMT360 to achieve a safe installation. The following Stahl barrier is acceptable, if the supply voltage to the barrier is between 24 - 35 VDC, the cable length between transmitter and barrier is less than 300m, and the external load created by additional components in the loop is less than 200 ohms. If the installation requirements do not satisfy these parameters, then please consult the HMT360 manual (www.vaisala.com) or contact a manufacturer of safety barriers for additional assistance.**

| **Accessories and Spare Parts :** | **Description** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Stahl Zener Barrier (Stahl # 9001/51-280-091-141) (active barrier that requires active input) | 210664 | $190/channel |
| | Vyniker enclosure (enclosure holds 2 barriers) | 210665 | $90 each |

## HMT363 Humidity and Temperature Transmitter

**For general use**

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| | **Vaisala HUMICAP® Humidity and Temperature Transmitter** | | **HMT360** | **3** | | | | | | | | | | | | | **A** | | | **PRICE** |
| 1 | **Transmitter type** | | **HMT363** | **3** | | | | | | | | | | | | | | | | |
| 2 | **Parameters** | | *RH+T* | *A* | | | | | | | | | | | | | | | | $2,160 |
| | | | *RH+T+Td+a+Tw+x* | *D* | | | | | | | | | | | | | | | | $2,710 |
| 3 | **Display** | | **No display** | **1** | | | | | | | | | | | | | | | | |
| | | | *Display on transmitter cover* | *2* | | | | | | | | | | | | | | | | $120 |
| 4 | **Signal Output** | | 2 analog output channels (Ch1 + Ch2) 4... 20 mA | **2** | | | | | | | | | | | | | | | | |
| | **Transmitter unit** **Parameter and scaling for analog output (Ch1 & Ch2)** | | **No analog output** | | | | | | **A** | | | | | | | | | | | |
| | | | **RH (0... 100%RH)** | | | | | **B** | **B** | | | | | | | | | | | |
| | | | **T (choose range in next section)** | | | | | **C** | **C** | | | | | | | | | | | |
| | | | **Td (-40...100°C)** | ***(-40...212°F)*** | | | | **H** | **H** | | | | | | | | | | | |
| | | | **a (0...500g/m3)** | ***(0...218.5gr/ft3)*** | | | | **J** | **J** | | | | | | | | | | | |
| | | | **Tw (0...100°C)** | ***(+32...+212°F)*** | | | | **K** | **K** | | | | | | | | | | | |
| | | | **x (0...500g/kg d.a)** | ***(0...3500gr/lb)*** | | | | **L** | **L** | | | | | | | | | | | |
| | | **Special:** Define quantity for: | CH1:_____ | CH2:_____ | | | | **X** | **X** | | | | | | | | | | | |
| | | Define scale for: | CH1:_____ | CH2:_____ | | | | | | | | | | | | | | | | |
| | **NOTE:** | | | | | | | | | | | | | | | | | | | |
| 5 | **- Td, a, Tw and x are only avalable with parameter selection D** | | | | **Ch1** | | | | | | | | | | | | | | | |
| 6 | **- If only one analog output has been chosen, choose A for Ch2** | | | | **Ch2** | | | | | | | | | | | | | | | |
| 7 | **Analog output range for temperature** | | **-20...+80°C** | ***(-4...+176°F)*** | | | | | | **D** | | | | | | | | | | |
| | | | **-20...+120°C** | ***(-4...+248°F)*** | | | | | | **E** | | | | | | | | | | |
| | | | **-40...+80°C** | ***(-40...+176°F)*** | | | | | | **F** | | | | | | | | | | |
| | **- If no temperature output is desired, cho** | | **-40...+120°C** | ***(-40...+248°F)*** | | | | | | **G** | | | | | | | | | | |
| | | | **0...+100°C** | ***(+32...+ 212°F)*** | | | | | | **H** | | | | | | | | | | |
| | | | **Special** | | | | | | | **X** | | | | | | | | | | |
| 8 | **Output units** | | **Metric** | | | | | | | | **1** | | | | | | | | | |
| | | | **Non-metric** | | | | | | | | **2** | | | | | | | | | |
| 9 | **Interface cable connection** | | **Cable gland M20x1.5 for cable diameters 7.5 ... 12 mm** | | | | | | | | | **A** | | | | | | | | |
| | | | **Conduit fitting NPT1/2"** | (for wire conduits) | | | | | | | | **B** | | | | | | | | |
| | | | **Cable gland M20x1.5 for cable diameters 10 ... 15 mm** | | | | | | | | | **C** | | | | | | | | |
| 10 | **Ex certification and issuer** | | **ATEX 100a 94/9/EC (PTB)** | | | | | | | | | | **2** | | | | | | | |
| | | | **Factory Mutual (USA)** | | | | | | | | | | **4** | | | | | | | |
| | | | **CSA (Canada)** | | | | | | | | | | **5** | | | | | | | |
| | | | **TIIS (Japan)** | | | | | | | | | | **7** | | | | | | | |
| 11 | **User's guide** | | **No manual** | | | | | | | | | | | **A** | | | | | | |
| | | | **English** | | | | | | | | | | | **B** | | | | | | |
| 12 | **Probe and cable length** | | **2 m cable** | **max 80°C** | | | | | | | | | | | **1** | | | | | |
| | | | *5 m cable* | *max 80°C* | | | | | | | | | | | *2* | | | | | $150 |
| | | | *10 m cable* | *max 80°C* | | | | | | | | | | | *3* | | | | | $300 |
| | | | 2 m cable | max 120°C | | | | | | | | | | | B | | | | | $220 |
| | | | *5 m cable* | *max 120°C* | | | | | | | | | | | *C* | | | | | $360 |
| | | | *10 m cable* | *max 120°C* | | | | | | | | | | | *D* | | | | | $540 |
| 13 | **Sensor type** | | **HUMICAP 180** | | | | | | | | | | | | | **1** | | | | |
| | | | **HUMICAP 180L2** | | | | | | | | | | | | | **2** | | | | |
| | | | **HUMICAP 180R** | | | | | | | | | | | | | **5** | | | | |
| 14 | **Reserved for future option** | | | | | | | | | | | | | | | | **A** | | | |
| 15 | **Sensor protection** | | **PPS plastic grid & stainless steel netting (recommended choi** | DRW0101281SP | | | | | | | | | | | | | | **1** | | |
| | | | **PPS plastic grid** | DRW0101276SP | | | | | | | | | | | | | | **2** | | |
| | | | **Sintered stainless steel filter** | HM47280SP | | | | | | | | | | | | | | **3** | | |
| | | | **Stainless steel grid filter** | HM47453SP | | | | | | | | | | | | | | **4** | | |
| 16 | **Probe installation accessories** | | **None** | | | | | | | | | | | | | | | | **0** | |
| | | | *Duct installation kit* | | | | | | | | | | | | | | | | *B* | $80 |
| | | | | | | | | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
***Selections in italic are available at an extra price.***
**Shaded sections indicate typical selections.**

RH = Relative Humidity a = Absolute Humidity g/m3
T = Temperature x = Mixing Ratio g/Kg
Td = Dewpoint Temper Tw = Wet Bulb Temperature

**Example of order code with typical settings:**

| HMT360 | 3 | A | 2 | 2 | B | C | D | 2 | A | 4 | B | B | 5 | A | 1 | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**NOTE: Intrinsically Safe barriers are required with the HMT360 to achieve a safe installation. The following Stahl barrier is acceptable, if the supply voltage to the barrier is between 24 - 35 VDC, the cable length between transmitter and barrier is less than 300m, and the external load created by additional components in the loop is less than 200 ohms. If the installation requirements do not satisfy these parameters, then please consult the HMT360 manual (www.vaisala.com) or contact a manufacturer of safety barriers for additional assistance.**

| **Accessories and Spare Parts :** | **Description** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Stahl Zener Barrier (Stahl # 9001/51-280-091-141) (active barrier that requires active input) | 210664 | $190/channel |
| | Vyniker enclosure (enclosure holds 2 barriers) | 210665 | $90 each |



## HMT364 Humidity and Temperature Transmitter

**For high pressurized processes**

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| | **Vaisala HUMICAP® Humidity and Temperature Transmitter** | | **HMT360** | **4** | | | | | | | | | | | | | **A** | | | **PRICE** |
| 1 | **Transmitter type** | | **HMT364** | **4** | | | | | | | | | | | | | | | | |
| 2 | **Parameters** | | *RH+T* | *A* | | | | | | | | | | | | | | | | $3,270 |
| | | | *RH+T+Td+a+Tw+x* | *D* | | | | | | | | | | | | | | | | $3,810 |
| 3 | **Display** | | **No display** | **1** | | | | | | | | | | | | | | | | |
| | | | *Display on transmitter cover* | *2* | | | | | | | | | | | | | | | | $120 |
| 4 | **Signal Output** | | **2 analog output channels (Ch1 + Ch2** 4... 20 mA | **2** | | | | | | | | | | | | | | | | |
| | **Transmitter unit** **Parameter and scaling for analog output (Ch1 & Ch2)** | | **No analog output** | | | | | | **A** | | | | | | | | | | | |
| | | | **RH (0... 100%RH)** | | | | | **B** | **B** | | | | | | | | | | | |
| | | | **T (choose range in next section)** | | | | | **C** | **C** | | | | | | | | | | | |
| | | | **Td (-40...100°C)** | ***(-40...212°F)*** | | | | **H** | **H** | | | | | | | | | | | |
| | | | **a (0...500g/m3)** | ***(0...218.5gr/ft3)*** | | | | **J** | **J** | | | | | | | | | | | |
| | | | **Tw (0...100°C)** | ***(+32...+212°F)*** | | | | **K** | **K** | | | | | | | | | | | |
| | | | **x (0...500g/kg d.a)** | ***(0...3500gr/lb)*** | | | | **L** | **L** | | | | | | | | | | | |
| | | **Special:** Define quantity for: | CH1:_____ | CH2:_____ | | | | **X** | **X** | | | | | | | | | | | |
| | | Define scale for: | CH1:_____ | CH2:_____ | | | | | | | | | | | | | | | | |
| | **NOTE:** | | | | | | | | | | | | | | | | | | | |
| 5 | **- Td, a, Tw and x are only avalable with parameter selection D** | | | | **Ch1** | | | | | | | | | | | | | | | |
| 6 | **- If only one analog output has been chosen, choose A for Ch2** | | | | **Ch2** | | | | | | | | | | | | | | | |
| 7 | **Analog output range for temperature** | | **-20...+80°C** | ***(-4...+176°F)*** | | | | | | **D** | | | | | | | | | | |
| | | | **-20...+120°C** | ***(-4...+248°F)*** | | | | | | **E** | | | | | | | | | | |
| | | | **-40...+80°C** | ***(-40...+176°F)*** | | | | | | **F** | | | | | | | | | | |
| | **- If no temperature output is desired, choo** | | **-40...+120°C** | ***(-40...+248°F)*** | | | | | | **G** | | | | | | | | | | |
| | | | **0...+100°C** | ***(+32...+ 212°F)*** | | | | | | **H** | | | | | | | | | | |
| | | | **-20...+180°C** | ***(-4...+356°F)*** | | | | | | **J** | | | | | | | | | | |
| | | | **-40...+180 °C** | ***(-40...+356°F)*** | | | | | | **K** | | | | | | | | | | |
| | | | **0...+180°C** | ***(+32...+356°F)*** | | | | | | **L** | | | | | | | | | | |
| | | | **Special** | | | | | | | **X** | | | | | | | | | | |
| 8 | **Output units** | | **Metric** | | | | | | | | **1** | | | | | | | | | |
| | | | **Non-metric** | | | | | | | | **2** | | | | | | | | | |
| 9 | **Interface cable connection** | | **Cable gland M20x1.5 for cable diameters 7.5 ... 12 mm** | | | | | | | | | **A** | | | | | | | | |
| | | | **Conduit fitting NPT1/2"** | (for wire conduits) | | | | | | | | **B** | | | | | | | | |
| | | | **Cable gland M20x1.5 for cable diameters 10 ... 15 mm** | | | | | | | | | **C** | | | | | | | | |
| 10 | **Ex certification and issuer** | | **ATEX 100a 94/9/EC (PTB)** | | | | | | | | | | **2** | | | | | | | |
| | | | **Factory Mutual (USA)** | | | | | | | | | | **4** | | | | | | | |
| | | | **CSA (Canada)** | | | | | | | | | | **5** | | | | | | | |
| | | | **TIIS (Japan)** | | | | | | | | | | **7** | | | | | | | |
| 11 | **User's guide** | | **No manual** | | | | | | | | | | | **A** | | | | | | |
| | | | **English** | | | | | | | | | | | **B** | | | | | | |
| 12 | **Probe and cable length** | | **2 m cable** | | | | | | | | | | | | **E** | | | | | |
| | | | *5 m cable* | | | | | | | | | | | | *F* | | | | | $160 |
| | | | *10 m cable* | | | | | | | | | | | | *G* | | | | | $370 |
| 13 | **Sensor type** | | **HUMICAP 180** | | | | | | | | | | | | | **1** | | | | |
| | | | **HUMICAP 180L2** | | | | | | | | | | | | | **2** | | | | |
| | | | **HUMICAP 180R** | | | | | | | | | | | | | **5** | | | | |
| 14 | | | | | | | | | | | | | | | | | **A** | | | |
| 15 | **Sensor protection** | | **PPS plastic grid & stainless steel netting (recommended choic** | DRW0101281SP | | | | | | | | | | | | | | **1** | | |
| | | | **PPS plastic grid** | DRW0101276SP | | | | | | | | | | | | | | **2** | | |
| | | | **Sintered stainless steel filter** | HM47280SP | | | | | | | | | | | | | | **3** | | |
| | | | **Stainless steel grid filter** | HM47453SP | | | | | | | | | | | | | | **4** | | |
| 16 | **Probe installation accessories** | | **None** | | | | | | | | | | | | | | | | **0** | |
| | | | Fitting body M22x1.5 male | | | | | | | | | | | | | | | | K | |
| | | | Fitting body NPT 1/2" male | | | | | | | | | | | | | | | | G | |
| | | | | | | | | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
***Selections in italic are available at an extra price.***
**Shaded sections indicate typical selections.**

RH = Relative Humidity a = Absolute Humidity g/m3
T = Temperature x = Mixing Ratio g/Kg
Td = Dewpoint Tempera Tw = Wet Bulb Temperature

**Example of order code with typical settings:**

| HMT360 | 4 | A | 2 | 2 | B | C | D | 2 | A | 4 | B | E | 5 | A | 3 | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**NOTE: Intrinsically Safe barriers are required with the HMT360 to achieve a safe installation. The following Stahl barrier is acceptable, if the supply voltage to the barrier is between 24 - 35 VDC, the cable length between transmitter and barrier is less than 300m, and the external load created by additional components in the loop is less than 200 ohms. If the installation requirements do not satisfy these parameters, then please consult the HMT360 manual (www.vaisala.com) or contact a manufacturer of safety barriers for additional assistance.**

| **Accessories and Spare Parts :** | **Description** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Stahl Zener Barrier (Stahl # 9001/51-280-091-141) (active barrier that requires active input) | 210664 | $190/channel |
| | Vyniker enclosure (enclosure holds 2 barriers) | 210665 | $90 each |

## HMT365 Humidity and Temperature Transmitter

**For high temperatures**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| | **Vaisala HUMICAP® Humidity and Temperature Transmitter** | | | **HMT360** | **5** | | | | | | | | | | | | | **A** | | | **PRICE** |
| 1 | **Transmitter unit** | **Transmitter type** | | **HMT365** | **5** | | | | | | | | | | | | | | | | |
| 2 | | **Parameters** | | *RH+T* | *A* | | | | | | | | | | | | | | | | $2,840 |
| | | | | *RH+T+Td+a+Tw+x* | *D* | | | | | | | | | | | | | | | | $3,370 |
| 3 | | **Display** | | **No display** | **1** | | | | | | | | | | | | | | | | |
| | | | | *Display on transmitter cover* | *2* | | | | | | | | | | | | | | | | $120 |
| 4 | | **Signal Output** | | **2 analog output channels (Ch1 + Ch2 4... 20 mA** | **2** | | | | | | | | | | | | | | | | |
| | | **Parameter and scaling for** | | **No analog output** | | | | | | | | | | | | | | | | **A** | |
| | | **analog output (Ch1 & Ch2)** | | **RH (0... 100%RH)** | | | | | | | | | | | | | | | | **B** | **B** |
| | | | | **T (choose range in next section)** | | | | | | | | | | | | | | | | **C** | **C** |
| | | | | **Td (-40...100°C)** | ***(-40...212°F)*** | | | | | | | | | | | | | | | **H** | **H** |
| | | | | **a (0...500g/m3)** | ***(0...218.5gr/ft3)*** | | | | | | | | | | | | | | | **J** | **J** |
| | | | | **Tw (0...100°C)** | ***(+32...+212°F)*** | | | | | | | | | | | | | | | **K** | **K** |
| | | | | **x (0...500g/kg d.a)** | ***(0...3500gr/lb)*** | | | | | | | | | | | | | | | **L** | **L** |
| | | **Special:** | Define quantity for: | CH1:_____ | CH2:_____ | | | | | | | | | | | | | | | **X** | **X** |
| | | | Define scale for: | CH1:_____ | CH2:_____ | | | | | | | | | | | | | | | | |
| | | **NOTE:** | | | | | | | | | | | | | | | | | | | |
| 5 | | **- Td, a, Tw and x are only avalable with parameter selection D** | | | **Ch1** | | | | | | | | | | | | | | | | |
| 6 | | **- If only one analog output has been chosen, choose A for Ch2** | | | **Ch2** | | | | | | | | | | | | | | | | |
| 7 | | **Analog output range** | | **-20...+80°C** | ***(-4...+176°F)*** | | | | | | | | | | | | | | | | **D** |
| | | **for temperature** | | **-20...+120°C** | ***(-4...+248°F)*** | | | | | | | | | | | | | | | | **E** |
| | | | | **-40...+80°C** | ***(-40...+176°F)*** | | | | | | | | | | | | | | | | **F** |
| | | **- If no temperature output is desired, choo** | | **-40...+120°C** | ***(-40...+248°F)*** | | | | | | | | | | | | | | | | **G** |
| | | | | **0...+100°C** | ***(+32...+ 212°F)*** | | | | | | | | | | | | | | | | **H** |
| | | | | **-20...+180°C** | ***(-4...+356°F)*** | | | | | | | | | | | | | | | | **J** |
| | | | | **-40...+180 °C** | ***(-40...+356°F)*** | | | | | | | | | | | | | | | | **K** |
| | | | | **0...+180°C** | ***(+32...+356°F)*** | | | | | | | | | | | | | | | | **L** |
| | | | | **Special** | | | | | | | | | | | | | | | | | **X** |
| 8 | | **Output units** | | **Metric** | | | | | | | | | | | | | | | | **1** | |
| | | | | **Non-metric** | | | | | | | | | | | | | | | | **2** | |
| 9 | | **Interface cable connection** | | **Cable gland M20x1.5 for cable diameters 7.5 ... 12 mm** | | | | | | | | | | | | | | | | **A** | |
| | | | | **Conduit fitting NPT1/2"** | (for wire conduits) | | | | | | | | | | | | | | | **B** | |
| | | | | **Cable gland M20x1.5 for cable diameters 10 ... 15 mm** | | | | | | | | | | | | | | | | **C** | |
| 10 | | **Ex certification and issuer** | | **ATEX 100a 94/9/EC (PTB)** | | | | | | | | | | | | | | | **2** | | |
| | | | | **Factory Mutual (USA)** | | | | | | | | | | | | | | | **4** | | |
| | | | | **CSA (Canada)** | | | | | | | | | | | | | | | **5** | | |
| | | | | **TIIS (Japan)** | | | | | | | | | | | | | | | **7** | | |
| 11 | | **User's guide** | | **No manual** | | | | | | | | | | | | | | **A** | | | |
| | | | | **English** | | | | | | | | | | | | | | **B** | | | |
| 12 | | **Probe and cable length** | | **2 m cable** | | | | | | | | | | | | | | **H** | | | |
| | | | | *5 m cable* | | | | | | | | | | | | | | *J* | | | $160 |
| | | | | *10 m cable* | | | | | | | | | | | | | | *K* | | | $370 |
| 13 | | **Sensor type** | | **HUMICAP 180** | | | | | | | | | | | | | **1** | | | | |
| | | | | **HUMICAP 180L2** | | | | | | | | | | | | | **2** | | | | |
| | | | | **HUMICAP 180R** | | | | | | | | | | | | | **5** | | | | |
| 14 | | | | | | | | | | | | | | | | | | | **A** | | |
| 15 | | **Sensor protection** | | **PPS plastic grid & stainless steel netting (recommended choi** | DRW0101281SP | | | | | | | | | | | | | | **1** | | |
| | | | | **PPS plastic grid** | DRW0101276SP | | | | | | | | | | | | | | **2** | | |
| | | | | **Sintered stainless steel filter** | HM47280SP | | | | | | | | | | | | | | **3** | | |
| | | | | **Stainless steel grid filter** | HM47453SP | | | | | | | | | | | | | | **4** | | |
| 16 | | **Probe installation accessories** | | **None** | | | | | | | | | | | | | | | **0** | | |
| | | | | *Mounting flange* | | | | | | | | | | | | | | | *D* | | $60 |
| | | | | | | | | | | | | | | | | | | | TOTAL | | |
| | | | | | | | | | | | | | | | | | | | QTY | | |
| | | | | | | | | | | | | | | | | | | | TOTAL VALUE | | |

**Selections in bold are included in the prices of the basic versions.**
***Selections in italic are available at an extra price.***
**Shaded sections indicate typical selections.**

RH = Relative Humidity a = Absolute Humidity g/m3
T = Temperature x = Mixing Ratio g/Kg
Td = Dewpoint Temper Tw = Wet Bulb Temperature

**Example of order code with typical settings:**

| **HMT360** | 5 | A | 2 | 2 | B | C | D | 2 | A | 4 | B | H | 5 | A | 1 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**NOTE: Intrinsically Safe barriers are required with the HMT360 to achieve a safe installation. The following Stahl barrier is acceptable, if the supply voltage to the barrier is between 24 - 35 VDC, the cable length between transmitter and barrier is less than 300m, and the external load created by additional components in the loop is less than 200 ohms. If the installation requirements do not satisfy these parameters, then please consult the HMT360 manual (www.vaisala.com) or contact a manufacturer of safety barriers for additional assistance.**

| **Accessories and Spare Parts :** | **Description** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Stahl Zener Barrier (Stahl # 9001/51-280-091-141) (active barrier that requires active input) | 210664 | $190/channel |
| | Vyniker enclosure (enclosure holds 2 barriers) | 210665 | $90 each |



## HMT367 Humidity and Temperature Transmitter

**For high humidities**

| | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Humidity and Temperature Transmitter** | | | **HMT360** | **7** | | | | | | | | | | | | | | **A** | | | **PRICE** |
| 1 | **Transmitter unit** | **Transmitter type** | | **HMT367** | **7** | | | | | | | | | | | | | | | | | |
| 2 | | **Parameters** | | *RH+T* | *A* | | | | | | | | | | | | | | | | | $2,840 |
| | | | | *RH+T+Td+a+Tw+x* | *D* | | | | | | | | | | | | | | | | | $3,370 |
| 3 | | **Display** | | **No display** | **1** | | | | | | | | | | | | | | | | | |
| | | | | *Display on transmitter cover* | *2* | | | | | | | | | | | | | | | | | $120 |
| 4 | | **Signal Output** | | **2 analog output channels (Ch1 + Ch2 4... 20 mA** | **2** | | | | | | | | | | | | | | | | | |
| | | **Parameter and scaling for** | | **No analog output** | | | | | | | | | | | | | | | | | **A** | |
| | | **analog output (Ch1 & Ch2)** | | **RH (0... 100%RH)** | | | | | | | | | | | | | | | | | **B** | **B** |
| | | | | **T (choose range in next section)** | | | | | | | | | | | | | | | | | **C** | **C** |
| | | | | **Td (-40...100°C)** | ***(-40...212°F)*** | | | | | | | | | | | | | | | | **H** | **H** |
| | | | | **a (0...500g/m3)** | ***(0...218.5gr/ft3)*** | | | | | | | | | | | | | | | | **J** | **J** |
| | | | | **Tw (0...100°C)** | ***(+32...+212°F)*** | | | | | | | | | | | | | | | | **K** | **K** |
| | | | | **x (0...500g/kg d.a)** | ***(0...3500gr/lb)*** | | | | | | | | | | | | | | | | **L** | **L** |
| | | **Special:** | Define quantity for: | CH1:_____ | CH2:_____ | | | | | | | | | | | | | | | | **X** | **X** |
| | | | Define scale for: | CH1:_____ | CH2:_____ | | | | | | | | | | | | | | | | | |
| | | **NOTE:** | | | | | | | | | | | | | | | | | | | | |
| 5 | | **- Td, a, Tw and x are only avalable with parameter selection D** | | | **Ch1** | | | | | | | | | | | | | | | | | |
| 6 | | **- If only one analog output has been chosen, choose A for Ch2** | | | **Ch2** | | | | | | | | | | | | | | | | | |
| 7 | | **Analog output range** | | **-20...+80°C** | ***(-4...+176°F)*** | | | | | | | | | | | | | | | | | **D** |
| | | **for temperature** | | **-20...+120°C** | ***(-4...+248°F)*** | | | | | | | | | | | | | | | | | **E** |
| | | | | **-40...+80°C** | ***(-40...+176°F)*** | | | | | | | | | | | | | | | | | **F** |
| | | **- If no temperature output is desired, choo** | | **-40...+120°C** | ***(-40...+248°F)*** | | | | | | | | | | | | | | | | | **G** |
| | | | | **0...+100°C** | ***(+32...+ 212°F)*** | | | | | | | | | | | | | | | | | **H** |
| | | | | **-20...+180°C** | ***(-4...+356°F)*** | | | | | | | | | | | | | | | | | **J** |
| | | | | **-40...+180 °C** | ***(-40...+356°F)*** | | | | | | | | | | | | | | | | | **K** |
| | | | | **0...+180°C** | ***(+32...+356°F)*** | | | | | | | | | | | | | | | | | **L** |
| | | | | **Special** | | | | | | | | | | | | | | | | | | **X** |
| 8 | | **Output units** | | **Metric** | | | | | | | | | | | | | | | | | **1** | |
| | | | | **Non-metric** | | | | | | | | | | | | | | | | | **2** | |
| 9 | | **Interface cable connection** | | **Cable gland M20x1.5 for cable diameters 7.5 ... 12 mm** | | | | | | | | | | | | | | | | | **A** | |
| | | | | **Conduit fitting NPT1/2"** | (for wire conduits) | | | | | | | | | | | | | | | | **B** | |
| | | | | **Cable gland M20x1.5 for cable diameters 10 ... 15 mm** | | | | | | | | | | | | | | | | | **C** | |
| 10 | | **Ex certification and issuer** | | **ATEX 100a 94/9/EC (PTB)** | | | | | | | | | | | | | | | | **2** | | |
| | | | | **Factory Mutual (USA)** | | | | | | | | | | | | | | | | **4** | | |
| | | | | **CSA (Canada)** | | | | | | | | | | | | | | | | **5** | | |
| | | | | **TIIS (Japan)** | | | | | | | | | | | | | | | | **7** | | |
| 11 | | **User's guide** | | **No manual** | | | | | | | | | | | | | | | | **A** | | |
| | | | | **English** | | | | | | | | | | | | | | | | **B** | | |
| 12 | | **Probe and cable length** | | **2 m cable** | | | | | | | | | | | | | | | **V** | | | |
| | | | | *5 m cable* | | | | | | | | | | | | | | | *W* | | | $160 |
| | | | | *10 m cable* | | | | | | | | | | | | | | | *X* | | | $370 |
| 13 | | **Sensor type** | | **HUMICAP 180** | | | | | | | | | | | | | | **1** | | | | |
| | | | | **HUMICAP 180L2** | | | | | | | | | | | | | | **2** | | | | |
| | | | | **HUMICAP 180R** | | | | | | | | | | | | | | **5** | | | | |
| 14 | | **Reserved for future option** | | | | | | | | | | | | | | | | | **A** | | | |
| 15 | | **Sensor protection** | | **PPS plastic grid & stainless steel netting (recommended choic** | DRW0101281SP | | | | | | | | | | | | | | **1** | | | |
| | | | | **PPS plastic grid** | DRW0101276SP | | | | | | | | | | | | | | **2** | | | |
| | | | | **Sintered stainless steel filter** | HM47280SP | | | | | | | | | | | | | | **3** | | | |
| | | | | **Stainless steel grid filter** | HM47453SP | | | | | | | | | | | | | | **4** | | | |
| 16 | | **Probe installation accessories** | | **None** | | | | | | | | | | | | | | | **0** | | | |
| | | | | *Duct installation kit* | | | | | | | | | | | | | | | *B* | | | $80 |
| | | | | *Cable Gland AGRO* | | | | | | | | | | | | | | | *J* | | | $60 |
| | | | | *Swagelok NPT 1/2"* | | | | | | | | | | | | | | | *L* | | | $60 |
| | | | | *Swagelok ISO 3/8"* | | | | | | | | | | | | | | | *M* | | | $60 |
| | | | | | | | | | | | | | | | | | | | TOTAL | | | |
| | | | | | | | | | | | | | | | | | | | QTY | | | |
| | | | | | | | | | | | | | | | | | | | TOTAL VALUE | | | |

**Selections in bold are included in the prices of the basic versions.**
***Selections in italic are available at an extra price.***
**Shaded sections indicate typical selections.**

RH = Relative Humidity a = Absolute Humidity g/m3
T = Temperature x = Mixing Ratio g/Kg
Td = Dewpoint Tempera Tw = Wet Bulb Temperature

**Example of order code with typical settings:**

| **HMT360** | 7 | A | 2 | 2 | B | C | D | 2 | A | 4 | B | V | 5 | A | 1 | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**NOTE: Intrinsically Safe barriers are required with the HMT360 to achieve a safe installation. The following Stahl barrier is acceptable, if the supply voltage to the barrier is between 24 - 35 VDC, the cable length between transmitter and barrier is less than 300m, and the external load created by additional components in the loop is less than 200 ohms. If the installation requirements do not satisfy these parameters, then please consult the HMT360 manual (www.vaisala.com) or contact a manufacturer of safety barriers for additional assistance.**

| **Accessories and Spare Parts :** | **Description** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Stahl Zener Barrier (Stahl # 9001/51-280-091-141) (active barrier that requires active input) | 210664 | $190/channel |
| | Vyniker enclosure (enclosure holds 2 barriers) | 210665 | $90 each |

## HMT368 Humidity and Temperature Transmitter

**For pressurized pipelines**

| | | |

## HMT100 Series Humidity and Temperature Transmitter

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Humidity and Temperature Transmitter** | | | | | | | | **HMT100** | | | | | | **0** | **0** | **PRICE** |
| 1 | **Transmitter type** | **Wall mount/fixed probe** | | | | | | | **A** | | | | | | | | $430 |
| | | **Remote probe with 3 m cable** | | | | | | | **B** | | | | | | | | $580 |
| | | **Remote probe with 5 m cable** | | | | | | | **C** | | | | | | | | $600 |
| | | **Remote probe with 10 m cable** | | | | | | | **D** | | | | | | | | $620 |
| | | **Remote probe with 10 m cable + 10 m extension** | | | | | | | **E** | | | | | | | | $710 |
| 2 | **Display** | **No display** | | | | | | | **0** | | | | | | | | |
| | | *Display *)* | | | | | | | 1 | | | | | | | | $100 |
| 3 | **Output channels ***)** | **RH or Td only** | | | | | | | | 1 | | | | | | | |
| | | *Two output parameters* | | | | | | | | 2 | | | | | | | $100 |
| 4 | **Signal output ***)** | **4... 20 mA** | **2-wire loop-powered** | | | | | | | | **A** | | | | | | |
| | | **0... 1 V** | **3-wire** | | | | | | | | **B** | | | | | | |
| | | **0... 5 V** | **3-wire** | | | | | | | | **C** | | | | | | |
| | | **0... 10 V** | **3-wire** | | | | | | | | **D** | | | | | | |
| | **SPECIAL** | **Define scale:** | **3-wire** | **0… _____ V **)** | | | | | | | **X** | | | | | | |
| 5 | **Parameter for Ch1 ***)** | **RH** | **0…100 %RH** | | | | | | | | | **1** | | | | | |
| | | **Td** | **-20...+80°C** | **(-4...+176°F)** | | | | | | | | **6** | | | | | |
| | | **Define quantity** | **_____ Scale** | **_____** | | | | | | | | **X** | | | | | |
| 6 | **Parameter for Ch2 ***)** | **No** | | | | | | | | | | | **0** | | | | |
| | | **T** | **-40...+60°C** | **(-40...+140°F)** | | | | | | | | | **2** | | | | |
| | | | **-20...+80°C** | **(-4...+176°F)** | | | | | | | | | **3** | | | | |
| | | | **0...+60°C** | **(+32...+140°F)** | | | | | | | | | **4** | | | | |
| | | | **-40...+80°C** | **(-40...+176°F)** | | | | | | | | | **5** | | | | |
| | | | **0...+50°C** | **('32...+122°F)** | | | | | | | | | **7** | | | | |
| | **SPECIAL** | **Define scale** | **_____** | | | | | | | | | | **X** | | | | |
| 7 | **Output units ***)** | **Metric** | | | | | | | | | | | | **1** | | | |
| | | **Non-metric** | | | | | | | | | | | | **2** | | | |
| 8 | **Humidity sensor type** | **General purpose** | | **HUMICAP180** | | | | | | | | | | | **A** | | |
| 9 | **Sensor protection** | *Plastic grid* | | (DRW010522) | | | | | | | | | | | 1 | | |
| | | *Plastic grid with filter* | | (DRW010525) | | | | | | | | | | | 2 | | |
| | | *Sintered stainless steel filter* | | (HM46670SP) | | | | | | | | | | | 3 | | |
| 10 | **Transmitter installation** | **Wall mounting plate (plastic)** | | (GM45160) | | | | | | | | | | | | **A** | |
| | | *Wall mounting plate (Aluminum)* | | (DRW010712) | | | | | | | | | | | | *B* | $30 |
| | | *Outdoor installation kit (Weather shield)* | | (215109) | | | | | | | | | | | | *C* | $110 |
| 11 | **Installation kit for probe** | **No accessories** | | | | | | | | | | | | | | **1** | |
| | | *Duct installation kit* | | (215619) | | | | | | | | | | | | *2* | $20 |
| | | *DTR502B with probe installation kit* | | (HMT100DTR502B) | | | | | | | | | | | | *3* | $310 |
| 12 | **Cable bushings** | **Cable gland for 2…6 mm cable** | | | | | | | | | | | | | | | **A** |
| | | **Stainless steel liquid tight PG9** | | | | | | | | | | | | | | | **B** |
| | | **Conduit fitting NPT 1/2"** | | | | | | | | | | | | | | | **C** |
| 13 | **Operating manual language** | **No manual** | | | | | | | | | | | | | | | **A** |
| | | **English** | | (M210701EN-A) | | | | | | | | | | | | | **B** |
| 14 | | | | | | | | | | | | | | | **0** | | |
| 15 | | | | | | | | | | | | | | | | **0** | |
| | | | | | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | | | | TOTAL VALUE | |

*) backlight not available with 4…20 mA output
**) value must be between 0…10 V
***) These options can not be modified in the field.

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

**Example of order code with typical settings:**

| **HMT100** | **A** | **0** | **2** | **A** | **1** | **2** | **2** | **A** | **2** | **A** | **1** | **A** | **B** | **0** | **0** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## HMP100 Probe for HMT100 Series

| | | | | **PRICE** |
|---|---|---|---|---|
| **Vaisala HUMICAP® Probe** | | | **HMP100** **A** | $280 |
| **Humidity sensor** | **HUMICAP®180** | | **A** | |
| **Sensor protection** | **Plastic grid** | (DRW010522) | **1** | |
| | **Plastic grid with filter** | (DRW010525) | **2** | |
| | **Stainless steel sintered filter** | (HM46670SP) | **3** | |
| | | | TOTAL | |
| | | | QTY | |
| | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

**Example of order code with typical settings:**

| **HMP100** | **A** | **2** |
|---|---|---|



## Vaisala INTERCAP® Humidity and Temperature

**Probe HMP60**

| | **Vaisala HUMICAP®** | | | | PRICE |
|---|---|---|---|---|---|
| | **Humidity and Temperature Probe** | | **HMP60** | | $240 |
| 1 | Output signals | **0...1 V** | **A** | | |
| | | **0...2.5 V** | **B** | | |
| | | **0...5 V** | **C** | | |
| | | **1 ...5V** | **D** | | |
| | | **Scaling for 4..20 mA converter (channel 1 only)** | **I** | | |
| | | **RS485** | **R** | | |
| 2 | Measured parameter for channel 1 | **None - RS485** | | **0** | |
| | | **RH** | | **1** | |
| | | **T** | **(-40 ... +60°C)** | **2** | |
| | | **Td** | **(-40 ... +60°C)** | **3** | |
| 3 | Measured parameter for channel 2 | **None - RS485 or current interface** | | **0** | |
| | | **RH** | | **1** | |
| | | **T** | **(-40 ... +60°C)** | **2** | |
| | | **Td** | **(-40 ... +60°C)** | **3** | |
| 4 | Sensor protection | **Plastic grid with filter** | **(DRW010525)** | **A** | |
| | | **Plastic grid** | **(DRW010522)** | **B** | |
| | | *Stainless steel sintered filter* | *(HM46670SP)* | *C* | $45 |
| 5 | Accessories | **No accessories** | | **0** | |
| | | **Pair of plastic nuts** | **(18350SP)** | **1** | |
| 6 | Humidity sensor | **Intercap** | | A | |
| 7 | Probe cable length | **No cable** | | **1** | |
| | | 60 °C cable 0.3 m | (HMP50Z032) | 2 | $10 |
| | | 60 °C cable 3 m | (HMP50Z30A) | 3 | $20 |
| | | 180 °C FEP cable 3m | (226902) | F | $60 |
| 8 | User guide | **No user guide** | | **A** | |
| | | **Multilingual quick guide** | | **B** | |
| 9 | Loop power converter | **No converter** | | **0** | |
| | | *4...20 mA loop power converter* | (ui-converter -1) | *1* | $45 |
| | | | | TOTAL | |
| | | | | QTY | |
| | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| **HMP60** | **A** | **1** | **2** | **A** | **0** | **A** | **1** | **B** | **0** |
|---|---|---|---|---|---|---|---|---|---|

| **Acessories and Spare Parts:** | **Description:** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Probe mounting flange | 226061 | $51 |
| | Mounting bracket with lid | 225979 | $85 |
| | (enclosure for 4-20mA loop power converter) | | |
| | Probe mounting clamp set (10 pcs) | 226067 | $102 |
| | USB cable | 219690 | $100 |
| | Plastic nuts | 18350SP | $10 |

## Vaisala HUMICAP® Humidity and Temperature

**Probe HMP110**

| | Vaisala HUMICAP® Humidity and Temperature Probe | | | HMP110 | | | | | | | | | PRICE $480 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Output signals | **0...1 V** | | | **A** | | | | | | | | |
| | | **0...2.5 V** | | | **B** | | | | | | | | |
| | | **0...5 V** | | | **C** | | | | | | | | |
| | | **1 ...5V** | | | **D** | | | | | | | | |
| | | **Scaling for 4..20 mA converter (channel 1 only)** | | | **I** | | | | | | | | |
| | | **RS485** | | | **R** | | | | | | | | |
| 2 | Measured parameter for channel 1 | **None - RS485** | | | | **0** | | | | | | | |
| | | **RH** | | | | **1** | | | | | | | |
| | | **T** | **(-40 ... +80°C)** | | | **5** | | | | | | | |
| | | **Td** | **(-40 ... +80°C)** | | | **6** | | | | | | | |
| 3 | Measured parameter for channel 2 | **None - RS485 or current interface** | | | | | **0** | | | | | | |
| | | **RH** | | | | | **1** | | | | | | |
| | | **T** | **(-40 ... +80°C)** | | | | **5** | | | | | | |
| | | **Td** | **(-40 ... +80°C)** | | | | **6** | | | | | | |
| 4 | Sensor protection | **Plastic grid with filter** | **(DRW010525)** | | | | | **A** | | | | | |
| | | **Plastic grid** | **(DRW010522)** | | | | | **B** | | | | | |
| | | *Stainless steel sintered filter* | *(HM46670SP)* | | | | | *C* | | | | | $45 |
| 5 | Accessories | **No accessories** | | | | | | | **0** | | | | |
| | | **Pair of plastic nuts** | **(18350SP)** | | | | | | **1** | | | | |
| 6 | Humidity sensor | **Humicap180R** | | | | | | | | C | | | |
| 7 | Probe cable length | **No cable** | | | | | | | | | **1** | | |
| | | *60 °C cable 0.3 m* | *(HMP50Z032)* | | | | | | | | 2 | | $10 |
| | | *60 °C cable 3 m* | *(HMP50Z30A)* | | | | | | | | 3 | | $20 |
| | | *80 °C cable 1.5 m* | *(225777)* | | | | | | | | 4 | | $35 |
| | | *80 °C cable 3 m* | *(225229)* | | | | | | | | 5 | | $45 |
| | | 180 °C FEP cable 3m | (226902) | | | | | | | | F | | $60 |
| 8 | User guide | **No user guide** | | | | | | | | | **A** | | |
| | | **Multilingual quick guide** | | | | | | | | | **B** | | |
| 9 | Loop power converter | **No converter** | | | | | | | | | | **0** | |
| | | *4...20 mA loop power converter* | (ui - converter -1) | | | | | | | | | *1* | $45 |
| | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| HMP110 | A | 1 | 5 | A | 0 | C | 1 | B | 0 |
|---|---|---|---|---|---|---|---|---|---|

| Acessories and Spare Parts: | Description: | Order Code: | PRICE |
|---|---|---|---|
| | Probe mounting flange | 226061 | $51 |
| | Mounting bracket with lid | 225979 | $85 |
| | (enclosure for 4-20mA loop power converter) | | |
| | Probe mounting clamp set (10 pcs) | 226067 | $102 |
| | USB cable | 219690 | $100 |
| | Plastic nuts | 18350SP | $10 |



## HMI41Set Humidity & Temperature Indicator and Probe

| | Vaisala HUMICAP® Humidity and Temperature Indicator | | HMI41SET | 1 | 2 | 3 | PRICE |
|---|---|---|---|---|---|---|---|
| 1 | **Probe** | **HMP41** | | **A** | | | $860 |
| | | **HMP42** | | **B** | | | $1,120 |
| | | **HMP45** | | **C** | | | $980 |
| | | **HMP46** | | **D** | | | $1,120 |
| | | **HMP44** | | **E** | | | $760 |
| | | **HMP44L** | | **F** | | | $780 |
| 2 | Carrying Case for HMI41 | **no case** | | | **1** | | |
| | and probe(s) | *Aluminum case for HMP41/42/45/46* | (MI70CASE2) | | *3* | | $160 |
| | | *Rigid plastic case for HMP41/42/45/46* | (210614) | | *5* | | $60 |
| 3 | Manual | **no manual** | | | | **A** | |
| | | **English** | | | | **B** | |
| | | | | | | TOTAL | |
| | | | | | | QTY | |
| | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

Example of order code with typical settings:

| HMI41SET | D | 5 | B |
|---|---|---|---|

| Accessories and Spare Parts: | Descripton: | Order Code: | PRICE |
|---|---|---|---|
| | Membrane filter tube set (5 pcs) for the HMP42 probe | 19858HM | $25 |
| | Steel grid for the HMP42 probe | 19867HM | $45 |
| | Serial interface cable for HMI41 | 19446ZZ | $40 |
| | Indicator only | HMI41 | $460 |
| | Calibration adapter for HMP42 probe | HM37067 | $20 |
| | Rubber sleeve set (10 pcs) for HMP42 probe | 19809HM | $20 |
| | **Connection Cables for:** | | |
| | HMD/W60/70 | 19116ZZ | $30 |
| | HMP230 Series | 19164ZZ | $30 |
| | HMD/W20/30 | 19165ZZ | $30 |
| | HMT330, HMT360 and HMT100 | 25917ZZ | $30 |
| | with over voltage-barrier HMT360 Series | 25905ZZ | $30 |
| | **HMI41 Spare Probes Only:** | HMP41 | $400 |
| | | HMP42 | $660 |
| | | HMP45 | $520 |
| | | HMP46 | $660 |
| | | HMP44 | $300 |
| | | HMP44L | $320 |

## HM70 Hand-held Humidity and Temperature Meter

| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Hand-Held Humidity and Temperature Meter** | | **HM70** | | | | **1** | | | | | **PRICE** |
| 1 | Indicator type | no indicator * | | A | | | | | | | | |
| | | *rechargable with Euro AC-adapter* | | *B* | | | | | | | | $840 |
| | | *rechargable with US AC-adapter* | (MI70USADAPTER + 26755) | *D* | | | | | | | | $840 |
| | | *alkaline batteries only* | (18950 (4 pieces)) | *K* | | | | | | | | $780 |
| 2 | Indicator accessories | **no indicator accessories** | | | **0** | | | | | | | |
| | | *MI70LINK(software with RS232 cable)* | (MI70LINK) | | *1* | | | | | | | $60 |
| | | *analog output-signal cable* | (27168ZZ) | | *2* | | | | | | | $35 |
| | | *MI70LINKand analog output-signal cable* | (MI70LINK + 27168ZZ) | | *3* | | | | | | | $95 |
| | | *MI70LINK software with USB cable* | (219687) | | *4* | | | | | | | $90 |
| 3 | Probe type | *HMP75* | | | | *A* | | | | | | $690 |
| | | *HMP75B (chemical purge and sensor preheating)* | | | | *F* | | | | | | $800 |
| | | *HMP76* | | | | *B* | | | | | | $840 |
| | | *HMP76B (chemical purge and sensor preheating)* | | | | *C* | | | | | | $950 |
| | | *HMP77* | | | | *D* | | | | | | $1,020 |
| | | *HMP77B (chemical purge and sensor preheating)* | | | | *E* | | | | | | $1,120 |
| 4 | Calibration | **at room temperature** | | | | | **1** | | | | | |
| 5 | Probe accessories | **no accessories** | | | | | | **A** | | | | |
| | | *probe holder for HMP76/76B*** | (HM36915) | | | | | *B* | | | | $25 |
| 6 | Connection cable | **no connection cable** | | | | | | | **0** | | | |
| | to a transmitter | *connection cable to 60/70/140 series transmitters* | (HMA6070) | | | | | | 1 | | | $60 |
| | | *connection cable to HMP230 series* | (27159ZZ) | | | | | | *2* | | | $60 |
| | | *connection cable to 20/30/130 series transmitters* | (HMA2030) | | | | | | *3* | | | $60 |
| | | *connection cable to HMT330 series / HMT100* | (211339) | | | | | | *4* | | | $60 |
| 7 | Carrying case | **no carrying case** | | | | | | | | **A** | | |
| | | *carrying case for indicator and probe (HMP75/77/77B)* | MI70CASE | | | | | | | *B* | | $140 |
| | | *carrying case for indicator and probe (HMP75/76/76B/77/77B)**** | MI70CASE2 | | | | | | | *C* | | $200 |
| 8 | Manual language | **no manual** | | | | | | | | | **A** | |
| | | **English** | | | | | | | | | **B** | |
| | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | QTY | |
| | | | | | | | | | | | TOTAL VALUE | |

* select item A, if only probe is ordered
** used in field calibration of duct 60/70 and 20/30 transmitters
*** case for two probes

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

Example of order code with typical settings:

| HM70 | D | 4 | A | 1 | A | 0 | B | B |
|---|---|---|---|---|---|---|---|---|

| **Accessories and Spare Parts:** | **Description:** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | US Adapter | MI70USADAPTER | $60 |
| | Battery NiMH 4.8 for MI70 | 26755 | $30 |
| **Probe Accessories:** | **HMP75** | | |
| | Plastic PC grid filter | 6221 | $30 |
| | Membrane filter | 10159HM | $30 |
| | Sintered bronze filter | DRW212987SP | $50 |
| | **HMP76/77** | | |
| | Plastic PPS grid filter | DRW010276SP | $30 |
| | Sintered stainless steel filter | HM47280SP | $50 |
| | Sintered bronze filter (HMP76 standard) | DRW212987SP | $50 |
| | PPS grid with SS netting (HMP77 standard) | DRW010281SP | $30 |



## HMK15 Humidity Calibrator
### With Two Standard Chambers

| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala Humidity Calibrator** | | **HMK15** | | | | | | | | | | $550 |
| 1 | Salt chamber | **no additional salt chamber** | | **A** | | | | | | | | | |
| | | *an additional salt chamber* | (19766HM) | *B* | | | | | | | | | $140 |
| 2 | LiCl salt | **no LiCl** | | | **0** | | | | | | | | |
| | | *LiCl (11 %RH) for one chamber* | (19729HM) | | *1* | | | | | | | | $40 |
| | | *LiCl (11 %RH) for two chambers* | | | *2* | | | | | | | | $80 |
| 3 | MgCl2 salt | **no MgCl2** | | | | **0** | | | | | | | |
| | | *MgCl2 (33%RH) for one chamber* | (19730HM) | | | *1* | | | | | | | $40 |
| | | *MgCl2 (33%RH) for two chambers* | | | | *2* | | | | | | | $80 |
| 4 | NaCl salt | **no NaCl** | | | | | **0** | | | | | | |
| | | *NaCl (75 %RH) for one chamber* | (19731HM) | | | | *1* | | | | | | $40 |
| | | *NaCl (75%RH) for two chambers* | | | | | *2* | | | | | | $80 |
| 5 | K2SO4 salt | **no K2SO4** | | | | | | **0** | | | | | |
| | | *K2SO4 (97 %RH) for one chamber* | (19732HM) | | | | | *1* | | | | | $40 |
| | | *K2SO4 (97 %RH) for two chambers* | | | | | | *2* | | | | | $80 |
| 6 | Ion exchanged water | **no water** | | | | | | | **A** | | | | |
| | | *water for three chambers* | (19767HM) | | | | | | *B* | | | | $20 |
| 7 | Carrying bag | **no bag** | | | | | | | | **0** | | | |
| | | *carrying bag* | (HM27032) | | | | | | | *1* | | | $140 |
| 8 | Thermometer | **with mercury** | (19728HM) | | | | | | | | **1** | | |
| | | **with red capillary liquid** | (25130HM) | | | | | | | | **2** | | |
| 9 | Manual | **no manual** | | | | | | | | | | **A** | |
| | | **English** | | | | | | | | | | **B** | |
| | | **French** | | | | | | | | | | **C** | |
| | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sectionss indicate typical selections.

Example of order code with typical settings:

| HMK15 | A | 1 | 0 | 1 | 0 | A | 0 | 1 | B |
|---|---|---|---|---|---|---|---|---|---|

| **Bulk Salt Accessories:** | **Description** | **Order Code** | **Size** | **PRICE** |
|---|---|---|---|---|
| | Lithium Chloride (LiCl) | 5236 | 250 g | $80 |
| | Sodium Chloride (NaCl) | 4102 | 1 kg | $40 |
| | Potassium Sulfate ($K_2SO_4$) | 2827 | 1 kg | $60 |

# DMW19 Dewpoint Wall Transmitter

| | | | | 1 | 2 | 3 | PRICE |
|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Dewpoint Transmitter** | | **DMW19** | | | | |
| 1 | **Analog output** | 0…1 V | | A | | | $630 |
| | | 0…5 V | | B | | | |
| | | 4…20 mA | | C | | | |
| 2 | **Dewpoint range for analog output** | **-20…+60 °C Td** | | | **1** | | |
| | | **-10 …+40 °C Td** | | | **2** | | |
| | | **0…+160 °F Td** | | | **4** | | |
| | | **+30…+130 °F Td** | | | **5** | | |
| | | **free scaling (specify):** | _____ | | **X** | | |
| 3 | **User Guide** | **No user guide** | | | | **A** | |
| | | **Multilingual user guide** | | | | **X** | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

Example of order code with typical settings:

| DMW19 | A | 1 | X |
|---|---|---|---|



## DMT342 Dewpoint and Temperature Transmitter

**With Small Size Flanged Probe for use with sampling cell**

| | | | |

# DMT344 Dewpoint and Temperature Transmitter

**For Pressurized Processes**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | PRICE |
| | **Vaisala DRYCAP® Dewpoint and Temperature Transmitter** | | | | | | | | | | | | | | | | | | | | | | | **DMT340** | **4** | | **0** | | | | | | | | | | | | **1** | | | | | **A** | **0** | |
| 1 | **Transmitter type** | **DMT344** | | | | | | | | | | | | | | | | | | | | | | | **4** | | | | | | | | | | | | | | | | | | | | $2,960 |
| 2 | **Probe Cable lengths** | **2 m cable (6.6 ft)** | | | | | | | | | | | | | | | | | | | | | | | | | **H** | | | | | | | | | | | | | | | | | |
| | | *5 m cable (16.4 ft)* | | | | | | | | | | | | | | | | | | | | | | | | | J | | | | | | | | | | | | | | | | | $160 |
| | | *10 m cable (32.8 ft)* | | | | | | | | | | | | | | | | | | | | | | | | | K | | | | | | | | | | | | | | | | | $370 |
| 3 | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | | | | | | | | | | | | | | |
| 4 | **Measurement** | **Dewpoint + PPM + Mixing ratio** | | | | | | | | | | | | | | | | | | | | | | **(for temperatures below 0° C)** | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | **Parameters** | **Dewpoint + PPM + Mixing ratio + Relative humidity + Temperature** | | | | | | | | | | | | | | | | | | | | | | **(for temperatures above 0° C)** | | | | | | | | | | | | | | | | | | | | | **B** | | |
| 5 | **Display** | **No display** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *Graphic Display with Keypad* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1** | | $320 |
| 6 | **Power Supply** | **10...35 VDC, 24 VAC** | | | | | | | | | | | | | | | | | | | | | | (HMT300PWS) | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | *10...35 VDC, 24 VAC with Galvanic Isolation for Outputs* | | | | | | | | | | | | | | | | | | | | | | (DCDC-1) | | | | | | | | | | | | | | | | | | | | | B | | $80 |
| | | *Universal AC -power (100....240 VAC)* | | | | | | | | | | | | | | | | | | | | | | (Power-1) | | | | | | | | | | | | | | | | | | | | | C | | $200 |
| | | *Universal AC -power (100....240 VAC) + US -power cord* | | | | | | | | | | | | | | | | | | | | | | (Power-1 & 215991) | | | | | | | | | | | | | | | | | | | | | D | | $210 |
| | | *External US AC-adapter (for LAN/WLAN interface in USA)* | | | | | | | | | | | | | | | | | | | | | | Not IP65 | | | | | | | | | | | | | | | | | | | | | K | | $60 |
| 7 | **Analog Output Signal** | **4... 20 mA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1** | | | | | | | | | | | | | | |
| | **for Ch1&Ch2(&Ch3)** | **0... 20 mA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **2** | | | | | | | | | | | | | | |
| | | **0... 1 V** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **3** | | | | | | | | | | | | | | |
| | | **0... 5 V** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **4** | | | | | | | | | | | | | | |
| | | **0... 10 V** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **5** | | | | | | | | | | | | | | |
| | **Analog Output Scaling** | **No 3rd analog output** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | **for Ch1&Ch2(&Ch3)** | **Dewpoint (-80...+20 °C)** | | | | | | | | | | | | | | | | | | | | | | **( -112...+68 °F)** | | | | | | | | | | | | | | | | | | | | | **B** | **B** | B |
| | | **Dewpoint (-60...+20 °C)** | | | | | | | | | | | | | | | | | | | | | | **( -76...+68 °F)** | | | | | | | | | | | | | | | | | | | | | **C** | **C** | C |
| | | **Dewpoint (-50...+50 °C)** | | | | | | | | | | | | | | | | | | | | | | **( -58...+122 °F)** | | | | | | | | | | | | | | | | | | | | | **D** | **D** | D |
| | | **Temperautre (0...+80 °C)** | | | | | | | | | | | | | | | | | | | | | | **(+32...+176 °F)** | | | | | | | | | | | | | | | | | | | | | **E** | **E** | E |
| | | **PPMv (0...1000 ppm)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **G** | | |
| | | **PPMw (0...1000 ppm)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **H** | | |
| | | **Mixing ratio (0...30g/kg d.a)** | | | | | | | | | | | | | | | | | | | | | | **(0...210gr/lbs)** | | | | | | | | | | | | | | | | | | | | | **J** | **J** | J |
| | | **Relative humidity (0...100%)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **K** | **K** | K |
| | **SPECIAL** | **Define parameter (unit) for Ch1:_____(____) Ch2:_____(____) Optional Ch3:_____(____)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **X** | **X** | X |
| | | **Define scale for Ch1:_____ Ch2:_____ Optional Ch3:_____** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Operating Pressure** | **1 bar (abs)** | | | | | | | | | | | | | | | | | | | | | | **(14.5 psi abs)** | | | | | | | | | | | | | | | | | | | | | **1** | | |
| | | **3 bar** | | | | | | | | | | | | | | | | | | | | | | **(43.5)** | | | | | | | | | | | | | | | | | | | | | **2** | | |
| | | **5 bar** | | | | | | | | | | | | | | | | | | | | | | **(72.5)** | | | | | | | | | | | | | | | | | | | | | **3** | | |
| | | **7 bar** | | | | | | | | | | | | | | | | | | | | | | **(101.5)** | | | | | | | | | | | | | | | | | | | | | **4** | | |
| | | **9 bar** | | | | | | | | | | | | | | | | | | | | | | **(130.5)** | | | | | | | | | | | | | | | | | | | | | **5** | | |
| | | **special ( max 50 bar / 725 psi )**** | | | | | | | | | | | | | | | | | | | | | | **(bar / psi)(abs)** | | | | | | | | | | | | | | | | | | | | | **X** | | |
| 12 | **Output Units** | **Metric units** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | **Non-metric units** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **B** | | |
| 13 | **Additional Option** | **No Additional Option** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *Alarm Relay Output* | | | | | | | | | | | | | | | | | | | | | | (Relay-1) | | | | | | | | | | | | | | | | | | | | | 1 | | $180 |
| | | *RS-485 Serial Interface with Galvanic Isolation* | | | | | | | | | | | | | | | | | | | | | | (RS485-1) | | | | | | | | | | | | | | | | | | | | | 2 | | $160 |
| | | *LAN (Ethernet) interface + 2 m cable (RJ45)* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | | $260 |
| | | *WLAN (wireless Ethernet) interface + antenna* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | | $320 |
| | | *Data Logging Module* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 | | $350 |
| 14 | **2nd Additional Option** | **No Additional Option** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *Alarm Relay Output* | | | | | | | | | | | | | | | | | | | | | | (Relay-1) | | | | | | | | | | | | | | | | | | | | | 1 | | $180 |
| | | *3rd Analog output* | | | | | | | | | | *Choose also analog output signal for Ch3* | | | | | | | | | | | | (AOUT-1) | | | | | | | | | | | | | | | | | | | | | 3 | | $160 |
| | | *Data Logging Module* | | | | | | | | | | *Not possible in the data logger has already been chosen in item 11* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 | | $350 |
| 15 | **User Cable Connection** | **Cable gland (for 8...11mm cable)** | | | | | | | | | | **(for 0.315...0.433 inch cable)** | | | | | | | | | | | | (214728SP) | | | | | | | | | | | | | | | | | | | | | **1** | | |
| | | **Conduit fitting for wire conduit (NPT1/2")** | | | | | | | | | | | | | | | | | | | | | | | | (214780SP) | | | | | | | | | | | | | | | | | | | | 2 | | |
| | | *Connector (M12, 8 pin) and Plug with 5m Black Cable* | | | | | | | | | | | | | | | | | | | | | | | | (212142) | | | | | | | | | | | | | | | | | | | | 3 | | $60 |
| | | *Connector (M12, 8 pin) and Plug for User's Cable* | | | | | | | | | | | | | | | | | | | | | | | | (212416) | | | | | | | | | | | | | | | | | | | | 4 | | $60 |
| 16 | **Transmitter Housing** | **Wall Mounting** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | **Installation** | *Wall Mounting (for adapting to DMP248)* | | | | | | | | | | | | | | | | | | | | | | | | (214829) | | | | | | | | | | | | | | | | | | | | B | | $90 |
| | | *Pipe/Pole Installation* | | | | | | | | | | | | | | | | | | | | | | | | (215108) | | | | | | | | | | | | | | | | | | | | C | | $100 |
| | | *Pipe/Pole Installation with Rain Shield for Outdoor Installations* | | | | | | | | | | | | | | | | | | | | | | | | (215109) | | | | | | | | | | | | | | | | | | | | D | | $110 |
| | | *DIN-Rail Installation* | | | | | | | | | | | | | | | | | | | | | | | | (215094) | | | | | | | | | | | | | | | | | | | | E | | $90 |
| 17 | **Dewpoint Sensor** | **DRYCAP® 180M** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1** | | |
| 18 | **Sensor Protection** | **Sintered stainless steel filter** | | | | | | | | | | | | | | | | | | | | | | | | (HM47280SP) | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | **Stainless steel filter for vacuum** | | | | | | | | | | | | | | | | | | | | | | | | (HM47453SP) | | | | | | | | | | | | | | | | | | | | B | | |
| 19 | **Probe Installation** | **FITTING BODY M22 x 1.5** | | | | | | | | | | | | | | | | | | | | | | | | (17223) | | | | | | | | | | | | | | | | | | | | | **2** | | |
| | **Accessories** | **FITTING BODY NPT1/2"** | | | | | | | | | | | | | | | | | | | | | | | | (17225) | | | | | | | | | | | | | | | | | | | | 3 | | |
| 20 | **User's guide language** | **No manual** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | **English** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **B** | | |
| 21 | **PC Accessories** | **No PC Accessories** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *MI70LINK software for Windows® with RS232 service cable* | | | | | | | | | | | | | | | | | | | | | | | | (215005) | | | | | | | | | | | | | | | | | | | | 2 | | $60 |
| | | *MI70LINK software for Windows® with USB service cable* | | | | | | | | | | | | | | | | | | | | | | | | (219916) | | | | | | | | | | | | | | | | | | | | 4 | | $90 |
| 22 | **Calibration** | **Standard Calibration, with NIST traceable certificate** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| 23 | **For future use** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

TOTAL
QTY
TOTAL VALUE

** if measuring in pressures above 20 bara (290 psia) please consult Vaisala sales

**Example of order code with typical settings:**

| DMT340 | 4 | H | 0 | B | 1 | A | 1 | B | E | A | 1 | B | 0 | 0 | 1 | A | 1 | A | 3 | B | 0 | A | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



# DMT347 Dewpoint and Temperature Transmitter

**With Small Pressure-tight Probe**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | PRICE |
| | **Vaisala DRYCAP® Dewpoint and Temperature Transmitter** | | | | | | | | | | | | | | | | | | | | | | | **DMT340** | **7** | | **0** | | | | | | | | | | | | **1** | | | | | **A** | **0** | |
| 1 | **Transmitter type** | **DMT340** | | | | | | | | | | | | | | | | | | | | | | | **7** | | | | | | | | | | | | | | | | | | | | $2,460 |
| 2 | **Probe Cable lengths** | **2 m cable (6.6 ft)** | | | | | | | | | | | | | | | | | | | | | | | | | **S** | | | | | | | | | | | | | | | | | |
| | | *5 m cable (16.4 ft)* | | | | | | | | | | | | | | | | | | | | | | | | | T | | | | | | | | | | | | | | | | | $160 |
| | | *10 m cable (32.8 ft)* | | | | | | | | | | | | | | | | | | | | | | | | | U | | | | | | | | | | | | | | | | | $370 |
| 3 | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | | | | | | | | | | | | | | |
| 4 | **Measurement** | **Dewpoint + PPM + Mixing ratio** | | | | | | | | | | | | | | | | | | | | | | **(for temperatures below 0° C)** | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | **Parameters** | **Dewpoint + PPM + Mixing ratio + Relative humidity + Temperature** | | | | | | | | | | | | | | | | | | | | | | **(for temperatures above 0° C)** | | | | | | | | | | | | | | | | | | | | | **B** | | |
| 5 | **Display** | **No display** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *Graphic Display with Keypad* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1** | | $320 |
| 6 | **Power Supply** | **10...35 VDC, 24 VAC** | | | | | | | | | | | | | | | | | | | | | | (HMT300PWS) | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | *10...35 VDC, 24 VAC with Galvanic Isolation for Outputs* | | | | | | | | | | | | | | | | | | | | | | (DCDC-1) | | | | | | | | | | | | | | | | | | | | | B | | $80 |
| | | *Universal AC -power (100....240 VAC)* | | | | | | | | | | | | | | | | | | | | | | (Power-1) | | | | | | | | | | | | | | | | | | | | | C | | $200 |
| | | *Universal AC -power (100....240 VAC) + US -power cord* | | | | | | | | | | | | | | | | | | | | | | (Power-1 & 215991) | | | | | | | | | | | | | | | | | | | | | D | | $210 |
| | | *External US AC-adapter (for LAN/WLAN interface in USA)* | | | | | | | | | | | | | | | | | | | | | | Not IP65 | | | | | | | | | | | | | | | | | | | | | K | | $60 |
| 7 | **Analog Output Signal** | **4... 20 mA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1** | | | | | | | | | | | | | | |
| | **for Ch1&Ch2(&Ch3)** | **0... 20 mA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **2** | | | | | | | | | | | | | | |
| | | **0... 1 V** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **3** | | | | | | | | | | | | | | |
| | | **0... 5 V** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **4** | | | | | | | | | | | | | | |
| | | **0... 10 V** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **5** | | | | | | | | | | | | | | |
| | **Analog Output Scaling** | **No 3rd analog output** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | **for Ch1&Ch2(&Ch3)** | **Dewpoint (-80...+20 °C)** | | | | | | | | | | **( -112...+68 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **B** | **B** | B |
| | | **Dewpoint (-60...+20 °C)** | | | | | | | | | | **( -76...+68 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **C** | **C** | C |
| | | **Dewpoint (-50...+50 °C)** | | | | | | | | | | **( -58...+122 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **D** | **D** | D |
| | | **Temperautre (0...+80 °C)** | | | | | | | | | | **(+32...+176 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **E** | **E** | E |
| | | **PPMv (0...1000 ppm)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **G** | | |
| | | **PPMw (0...1000 ppm)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **H** | | |
| | | **Mixing ratio (0...30g/kg d.a)** | | | | | | | | | | **(0...210gr/lbs)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **J** | **J** | J |
| | | **Relative humidity (0...100%)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **K** | **K** | K |
| | **SPECIAL** | **Define parameter (unit) for Ch1:_____(____) Ch2:_____(____) Optional Ch3:_____(____)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **X** | **X** | X |
| | | **Define scale for Ch1:_____ Ch2:_____ Optional Ch3:_____** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Operating Pressure** | **1 bar (abs)** | | | | | | | | | | | | | | | | | | | | | | **(14.5 psi abs)** | | | | | | | | | | | | | | | | | | | | | **1** | | |
| | | **3 bar** | | | | | | | | | | | | | | | | | | | | | | **(43.5)** | | | | | | | | | | | | | | | | | | | | | **2** | | |
| | | **5 bar** | | | | | | | | | | | | | | | | | | | | | | **(72.5)** | | | | | | | | | | | | | | | | | | | | | **3** | | |
| | | **7 bar** | | | | | | | | | | | | | | | | | | | | | | **(101.5)** | | | | | | | | | | | | | | | | | | | | | **4** | | |
| | | **9 bar** | | | | | | | | | | | | | | | | | | | | | | **(130.5)** | | | | | | | | | | | | | | | | | | | | | **5** | | |
| | | **special ( max 50 bar / 725 psi )**** | | | | | | | | | | | | | | | | | | | | | | **(bar / psi)(abs)** | | | | | | | | | | | | | | | | | | | | | **X** | | |
| 12 | **Output Units** | **Metric units** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | **Non-metric units** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **B** | | |
| 13 | **Additional Option** | **No Additional Option** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *Alarm Relay Output* | | | | | | | | | | | | | | | | | | | | | | (Relay-1) | | | | | | | | | | | | | | | | | | | | | 1 | | $180 |
| | | *RS-485 Serial Interface with Galvanic Isolation* | | | | | | | | | | | | | | | | | | | | | | (RS485-1) | | | | | | | | | | | | | | | | | | | | | 2 | | $160 |
| | | *LAN (Ethernet) interface + 2 m cable (RJ45)* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | | $260 |
| | | *WLAN (wireless Ethernet) interface + antenna* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | | $320 |
| | | *Data Logger Module* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 | | $350 |
| 14 | **2nd Additional Option** | **No Additional Option** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *Alarm Relay Output* | | | | | | | | | | | | | | | | | | | | | | (Relay-1) | | | | | | | | | | | | | | | | | | | | | 1 | | $180 |
| | | *3rd Analog output* | | | | | | | | | | *Choose also analog output signal for Ch3* | | | | | | | | | | | | (AOUT-1) | | | | | | | | | | | | | | | | | | | | | 3 | | $160 |
| | | *Data Logger Module* | | | | | | | | | | *Not possible if the data logger module has already been chosen in item 11* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 | | $350 |
| 15 | **User Cable Connection** | **Cable gland (for 8...11mm cable)** | | | | | | | | | | **(for 0.315...0.433 inch cable)** | | | | | | | | | | | | (214728SP) | | | | | | | | | | | | | | | | | | | | | **1** | | |
| | | **Conduit fitting for wire conduit (NPT1/2")** | | | | | | | | | | | | | | | | | | | | | | | | (214780SP) | | | | | | | | | | | | | | | | | | | | 2 | | |
| | | *Connector (M12, 8 pin) and Plug with 5m Black Cable* | | | | | | | | | | | | | | | | | | | | | | | | (212142) | | | | | | | | | | | | | | | | | | | | 3 | | $60 |
| | | *Connector (M12, 8 pin) and Plug for User's Cable* | | | | | | | | | | | | | | | | | | | | | | | | (212416) | | | | | | | | | | | | | | | | | | | | 4 | | $60 |
| 16 | **Transmitter Housing** | **Wall Mounting** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | **Installation** | *Wall Mounting (for adapting to DMP248)* | | | | | | | | | | | | | | | | | | | | | | | | (214829) | | | | | | | | | | | | | | | | | | | | B | | $90 |
| | | *Pipe/Pole Installation* | | | | | | | | | | | | | | | | | | | | | | | | (215108) | | | | | | | | | | | | | | | | | | | | C | | $100 |
| | | *Pipe/Pole Installation with Rain Shield for Outdoor Installations* | | | | | | | | | | | | | | | | | | | | | | | | (215109) | | | | | | | | | | | | | | | | | | | | D | | $110 |
| | | *DIN-Rail Installation* | | | | | | | | | | | | | | | | | | | | | | | | (215094) | | | | | | | | | | | | | | | | | | | | E | | $90 |
| 17 | **Dewpoint Sensor** | **DRYCAP® 180M** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **1** | | |
| 18 | **Sensor Protection** | **Sintered stainless steel filter** | | | | | | | | | | | | | | | | | | | | | | | | (HM47280SP) | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | **Stainless steel filter for vacuum** | | | | | | | | | | | | | | | | | | | | | | | | (HM47453SP) | | | | | | | | | | | | | | | | | | | | B | | |
| 19 | **Probe Installation** | **Swagelok connector ISO 3/8"** | | | | | | | | | | | | | | | | | | | | | | | | (SWG12ISO38) | | | | | | | | | | | | | | | | | | | | | **4** | | |
| | **Accessories** | **Swagelok connector NPT 1/2"** | | | | | | | | | | | | | | | | | | | | | | | | (SWG12NPT12) | | | | | | | | | | | | | | | | | | | | | **5** | | |
| | | **Swagelok connector ISO 1/2"** | | | | | | | | | | | | | | | | | | | | | | | | SWG12ISO12 | | | | | | | | | | | | | | | | | | | | | **K** | | |
| 20 | **User's guide language** | **No manual** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | **English** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **B** | | |
| 21 | **PC Accessories** | **No PC Accessories** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *MI70LINK software for Windows® with RS232 service cable* | | | | | | | | | | | | | | | | | | | | | | | | (215005) | | | | | | | | | | | | | | | | | | | | 2 | | $60 |
| | | *MI70LINK software for Windows® with USB service cable* | | | | | | | | | | | | | | | | | | | | | | | | (219916) | | | | | | | | | | | | | | | | | | | | 4 | | $90 |
| 22 | **Calibration** | **Standard Calibration, with NIST traceable certificate** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| 23 | **For future use** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

TOTAL
QTY
TOTAL VALUE

** if measuring in pressures above 20 bara (290 psia) please consult Vaisala sales

**Example of order code with typical settings:**

| DMT340 | 7 | S | 0 | B | 1 | A | 1 | B | E | A | 1 | B | 0 | 0 | 1 | A | 1 | A | 5 | B | 0 | A | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## DMT348 Dewpoint and Temperature Transmitter

**For Pressurized Pipelines**

| | | |

## DMT346 Dewpoint Transmitter

**With passive cooling for very hot processes**

| | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala DRYCAP® Dewpoint Transmitter** | | | **DMT340** | | **6** | | **0** | **K** | | | | | | | **1** | | | | | | **2** | **D** | **6** | | | **C** | | |
| 1 | **Transmitter type** | **DMT346** | | | | **6** | | | | | | | | | | | | | | | | | | | | | | | $4,600 |
| 2 | **Probe cable length** | **2 m cable (6.6 ft)** | | | | | **P** | | | | | | | | | | | | | | | | | | | | | | |
| | | *5 m cable (16.4 ft)* | | | | | Q | | | | | | | | | | | | | | | | | | | | | | $160 |
| | | *10 m cable (32.8 ft)* | | | | | R | | | | | | | | | | | | | | | | | | | | | | $370 |
| 3 | - | - | | | | | | **0** | | | | | | | | | | | | | | | | | | | | | |
| 4 | **Measurement parameters** | **Dewpoint + mixing ratio (+ SSR + Ts)*** | | | | | | | **K** | | | | | | | | | | | | | | | | | | | | |
| 5 | **Display** | **No display** | | | | | | | | **0** | | | | | | | | | | | | | | | | | | | |
| | | *Graphical display with keypad* | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | $320 |
| 6 | **Power supply** | **10...35 VDC, 24 VAC** | | (HMT300PWS) | | | | | | | **A** | | | | | | | | | | | | | | | | | | |
| | | *10...35 VDC, 24 VAC with galvanic isolation for outputs* | | (DCDC-1) | | | | | | | B | | | | | | | | | | | | | | | | | | $80 |
| | | *Universal AC -power (100....240 VAC)* | | (Power-1) | | | | | | | C | | | | | | | | | | | | | | | | | | $200 |
| | | *Universal AC -power (100....240 VAC) + US -power cord* | | (Power-1 & 215991) | | | | | | | D | | | | | | | | | | | | | | | | | | $210 |
| | | *External US AC-adapter (for LAN/WLAN interface in USA)* | | Not IP65 | | | | | | | K | | | | | | | | | | | | | | | | | | $60 |
| 7 | **Analog output** | **4... 20 mA** | | | | | | | | | | **1** | | | | | | | | | | | | | | | | | |
| | | **0... 20 mA** | | | | | | | | | | **2** | | | | | | | | | | | | | | | | | |
| | | **0... 1 V** | | | | | | | | | | **3** | | | | | | | | | | | | | | | | | |
| | | **0... 5 V** | | | | | | | | | | **4** | | | | | | | | | | | | | | | | | |
| | | **0... 10 V** | | | | | | | | | | **5** | | | | | | | | | | | | | | | | | |
| | **Analog output** | **No 3rd analog output** | | | | | | | | | | | | | | **A** | | | | | | | | | | | | | |
| | **parameter and scaling** | **Dewpoint (0...+100 °C)** | **( +32...+212 °F)** | | | | | | | | | | | | | **1** | **1** | **1** | | | | | | | | | | | |
| | **for Ch1&Ch2& Ch3** | **Mixing ratio (0...1000g/kg)** | **(0...7000gr/lbs)** | | | | | | | | | | | | | **2** | **2** | **2** | | | | | | | | | | | |
| | **SPECIAL** | **Define parameter (unit) for Ch1:**_____(____) **Ch2:**_____(____) | | | | | | | | | | | | | | **X** | **X** | **X** | | | | | | | | | | | |
| | | **Define scale for** **Ch1:**_____ **Ch2:**_____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | Channel 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | Channel 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | Channel 3, choose A, if not needed | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Operating pressure** | **ambient** | | | | | | | | | | | | | | | | **1** | | | | | | | | | | | |
| 12 | **Output units** | **Metric units** | | | | | | | | | | | | | | | | | **A** | | | | | | | | | | |
| | | **Non-metric units** | | | | | | | | | | | | | | | | | **B** | | | | | | | | | | |
| 13 | **Additional feature** | **None** | | | | | | | | | | | | | | | | | | **0** | | | | | | | | | |
| | | *Alarm Relay Output* | | (Relay-1) | | | | | | | | | | | | | | | | 1 | | | | | | | | | $180 |
| | | *RS-485 Serial Interface with Galvanic Isolation* | | (RS485-1) | | | | | | | | | | | | | | | | 2 | | | | | | | | | $160 |
| | | *LAN (ethernet) interface + 2 m cable (RJ45)* | | | | | | | | | | | | | | | | | | 4 | | | | | | | | | $260 |
| | | *WLAN (wireless ethernet) interface + antenna* | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | $320 |
| | | *Data Logging Module* | | | | | | | | | | | | | | | | | | 6 | | | | | | | | | $350 |
| 14 | **Additional feature 2** | **None** | | | | | | | | | | | | | | | | | | | **0** | | | | | | | | |
| | | *Alarm Relay Output* | | (Relay-1) | | | | | | | | | | | | | | | | | 1 | | | | | | | | $180 |
| | | *3rd analog output: Choose also analog output parameter and scale for Ch3* | | (AOUT-1) | | | | | | | | | | | | | | | | | 3 | | | | | | | | $160 |
| | | *Data Logging Module* | *Not possible if the data logger module has already been chosen in item 13* | | | | | | | | | | | | | | | | | | 6 | | | | | | | | $350 |
| 15 | **Interface cable connection** | **Cable gland (for 8...11 mm cable)** | **(for 0.315...0.433 inch cable)** | (214728SP) | | | | | | | | | | | | | | | | | | **1** | | | | | | | |
| | | **Conduit fitting for wire conduit (NPT1/2")** | | (214780SP) | | | | | | | | | | | | | | | | | | **2** | | | | | | | |
| | | *Connector (M12, 8 pin) and Plug with 5m Black Cable* | | (212142) | | | | | | | | | | | | | | | | | | 3 | | | | | | | $60 |
| | | *Connector (M12, 8 pin) and Plug for User's Cable* | | (212416) | | | | | | | | | | | | | | | | | | 4 | | | | | | | $60 |
| 16 | **Transmitter housing** | **Wall Mounting** | | | | | | | | | | | | | | | | | | | | | **A** | | | | | | |
| | **installation** | *Wall Mounting with Quick Installation or on Junction Boxes* | | (214829) | | | | | | | | | | | | | | | | | | | B | | | | | | $90 |
| | | *Pipe/Pole Installation* | | (215108) | | | | | | | | | | | | | | | | | | | C | | | | | | $100 |
| | | *Pipe/Pole Installation with Rain Shield for Outdoor Installations* | | (215109) | | | | | | | | | | | | | | | | | | | D | | | | | | $110 |
| | | *DIN-Rail Installation* | | (215094) | | | | | | | | | | | | | | | | | | | E | | | | | | $90 |
| 17 | **Sensor** | **DRYCAP®180S** | | | | | | | | | | | | | | | | | | | | | | **2** | | | | | |
| 18 | **Sensor Protection** | **Stainless steel sintered filter for cooling set** | | (HM46780) | | | | | | | | | | | | | | | | | | | | | **D** | | | | |
| 19 | **Probe installation accessories** | **With cooling set** | | (DMP246CS) | | | | | | | | | | | | | | | | | | | | | | **6** | | | |
| 20 | **User's guide** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | **English** | | | | | | | | | | | | | | | | | | | | | | | | | **K** | | |
| 21 | **PC accessories** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | |
| | | *MI70LINK software for Windows® with RS232 service cable* | | (215005) | | | | | | | | | | | | | | | | | | | | | | | | 2 | $60 |
| | | *MI70LINK software for Windows® with USB service cable* | | (219916) | | | | | | | | | | | | | | | | | | | | | | | | 4 | $90 |
| 22 | **Calibration** | **Standard Calibration with NIST traceable certificate** | | | | | | | | | | | | | | | | | | | | | | | | | | **C** | |
| 23 | **Service contract** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | | **0** | |

**Selections in bold are included in the prices of the basic versions.** TOTAL

*Selections in italic are available at an extra price.* QTY

Shaded sections indicate typical selections. TOTAL VALUE

* Sensor saturation rate (SSR) is a parameter describing the relative humidity at the sensor ( the margin to condense). Ts is the temperature at the sensor. These parameters do not give information on the humidity or

**Example of order code with typical settings:**

| DMT340 | 6 | P | 0 | K | 1 | A | 1 | 1 | 2 | A | 1 | B | 0 | 0 | 1 | A | 2 | D | 6 | K | 0 | C | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Spare Parts:**

| | | PRICE |
|---|---|---|
| Mounting flange for cooling set | 217490 | $300 |



## DMT152 Dewpoint Transmitter

| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala DRYCAP® Dewpoint Transmitter** | | | | | **DMT152** | | | | | | | | | | | | | | | | |
| 1 | Mechanical connection | **ISO G1/2" thread** | | | | | **A** | | | | | | | | | | | | | | | $1,510 |
| | | **NPT 1/2" thread** | | | | | **B** | | | | | | | | | | | | | | | $1,510 |
| | | **UNF 3/4"-16 thread** | | | | | **C** | | | | | | | | | | | | | | | $1,510 |
| 2 | Measurement parameters | **Td/f, ppm** | | | | | | **1** | | | | | | | | | | | | | | |
| | | **Td/f, ppm and ppmw for SF6 gas** | | | | | | **2** | | | | | | | | | | | | | | |
| 3 | Analog output Ch1 & Ch2 | **0...1 V** | | | | | | | **A** | | | | | | | | | | | | | |
| | + RS-485 as standard | **0...5 V** | | | | | | | **B** | | | | | | | | | | | | | |
| | | **0...10 V** | | | | | | | **C** | | | | | | | | | | | | | |
| | | **4...20 mA** | | | | | | | **D** | | | | | | | | | | | | | |
| | | **0...20 mA** | | | | | | | **E** | | | | | | | | | | | | | |
| 4 | Analog output parameter | **Td/f** | -80...+20 °C | -112...+68 °F | | | | | | **B** | | | | | | | | | | | | |
| | or function | **Td/f** | -100...0 °C | -148...+ 32 °F | | | | | | **C** | | | | | | | | | | | | |
| | for Ch1 | **ppm** | 0...100 ppm | | | | | | | **D** | | | | | | | | | | | | |
| | | **ppm** | 0...500 ppm | | | | | | | **E** | | | | | | | | | | | | |
| | | **Td/f , free scale** | Define: | Low | High | | | | | **X** | | | | | | | | | | | | |
| | | **ppm, free scale** | Define: | Low | High | | | | | **Y** | | | | | | | | | | | | |
| | | **ppmw for SF6, free scale** | Define: | Low | High | | | | | **F** | | | | | | | | | | | | |
| | | **Alarm level on/off output** | Define: | Parameter | Level | | | | | **1** | | | | | | | | | | | | |
| | | **Autocalibration & purge on/off output*** | | | | | | | | **2** | | | | | | | | | | | | |
| 5 | Analog output parameter | **Td/f** | -80...+20 °C | -112...+68 °F | | | | | | | **B** | | | | | | | | | | | |
| | or function | **Td/f** | -100...0 °C | -148...+ 32 °F | | | | | | | **C** | | | | | | | | | | | |
| | for Ch2 | **ppm** | 0...100 ppm | | | | | | | | **D** | | | | | | | | | | | |
| | | **ppm** | 0...500 ppm | | | | | | | | **E** | | | | | | | | | | | |
| | | **Td/f , free scale** | Define: | Low | High | | | | | | **X** | | | | | | | | | | | |
| | | **ppm, free scale** | Define: | Low | High | | | | | | **Y** | | | | | | | | | | | |
| | | **ppmw for SF6, free scale** | Define: | Low | High | | | | | | **F** | | | | | | | | | | | |
| | | **Alarm level on/off output** | Define: | Parameter | Level | | | | | | **1** | | | | | | | | | | | |
| | | **Autocalibration & purge on/off output*** | | | | | | | | | **2** | | | | | | | | | | | |
| 6 | Output units | **Metric units (Celsius)** | | | | | | | | | | **1** | | | | | | | | | | |
| | | **Non-metric units (Fahrenheit)** | | | | | | | | | | **2** | | | | | | | | | | |
| 7 | Pressure setting for | **None - no ppm output** | | | | | | | | | | | **0** | | | | | | | | | |
| | ppm calculation | **Ambient 1 bara / 14,76 psia** | | | | | | | | | | | **1** | | | | | | | | | |
| | | **Special (max 50 bar abs)** | Define pressure:_____ | bar | | | | | | | | | **X** | | | | | | | | | |
| 8 | Sensor Protection | **Stainless steel mesh filter** | | | | | | | | | | | | **A** | | | | | | | | |
| 9 | Cable for analog outputs | **None** | | | | | | | | | | | | | **0** | | | | | | | |
| | and power supply | *2 m (6.6 ft) cable with snap-on connector* | | (211598) | | | | | | | | | | | *1* | | | | | | | $10 |
| | (Port I) | *3 m (9.8 ft) shielded cable with threaded connector* | | (HMP50Z300SP) | | | | | | | | | | | *3* | | | | | | | $20 |
| | | *10 m (32.8 ft) shielded cable with threaded connector* | | (HMP50Z1000SP) | | | | | | | | | | | *5* | | | | | | | $60 |
| 10 | Cable for RS485 line | **None** | | | | | | | | | | | | | | **0** | | | | | | |
| | and power supply | *2 m (6.6 ft) cable with snap-on connector* | | (211598) | | | | | | | | | | | *1* | | | | | | | $10 |
| | (Port II) | *3 m (9.8 ft) shielded cable with threaded connector* | | (HMP50Z300SP) | | | | | | | | | | | *3* | | | | | | | $20 |
| | | *10 m (32.8 ft) shielded cable with threaded connector* | | (HMP50Z1000SP) | | | | | | | | | | | *5* | | | | | | | $60 |
| 11 | Installation accessories | **None** | | | | | | | | | | | | | | **0** | | | | | | |
| | ONLY for ISO1/2" thread | *Sampling cell* | | (DMT242SC) | | | | | | | | | | | *D* | | | | | | | $80 |
| | | *Sampling cell with swagelok 1/4" male connectors* | | (DMT242SC2) | | | | | | | | | | | *E* | | | | | | | $100 |
| | | *Sampling cell with quick connector and leak screw* | | (DSC74) | | | | | | | | | | | *F* | | | | | | | $100 |
| | | *Two-pressure sampling cell* | | (DSC74B) | | | | | | | | | | | *G* | | | | | | | $220 |
| | | *Two-pressure sampling cell with venting coil DSC74C* | | (DSC74C) | | | | | | | | | | | *H* | | | | | | | $340 |
| 12 | Special features | **None** | | | | | | | | | | | | | | | **A** | | | | | |
| 13 | Package | **Standard cardboard** | | | | | | | | | | | | | | | | **1** | | | | |
| | | *Plastic case* | | | | | | | | | | | | | | | | *2* | | | | $20 |
| 14 | User' s guide | **None** | | | | | | | | | | | | | | | | | **A** | | | |
| | | **Multilingual quick guide** | | | | | | | | | | | | | | | | | **X** | | | |
| | | | | | | | | | | | | | | | | | | | | | Total | |
| | | | | | | | | | | | | | | | | | | | | | Total value | |

* Indicates when autocalibration or sensor purge are activated - measurement is not active

**Selections in bold are included in the prices of the basic versions.**

*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| DMT152 | B | 1 | D | B | E | 2 | 0 | A | 1 | 0 | 0 | A | 1 | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| **Accessories:** | **Description** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Connection cable for MI70 indicator | 219980 | $100 |
| | USB serial interface cable | 219690 | $100 |
| | Sealing ring set ISO (copper, 3 pcs) | 221524 | $15 |
| | Sealing ring set UNF (copper, 3 pcs) | 221563 | $15 |
| | Stainless steel mesh filter 8 µm | 220957 | $50 |
| | Loop-powered display | 226476 | $250 |
| | 4…20mA/-80…20 °C Tdf, Nokeval 301 | | |
| | 100...240 VAC external power supply | POWER-1 | $200 |

# DMT242 Dewpoint Transmitter

| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala DRYCAP® Dewpoint Transmitter** | | | **DMT242** | | | | | | | | $1,310 |
| 1 | Dewpoint range for analog output | **-80…+20 °C Td, DRYCAP®180M** | | | **A** | | | | | | | |
| | | **-60…+60 °C Td, DRYCAP®180M** | | | **B** | | | | | | | |
| | | **Free scaling Td, DRYCAP®180M** | | | **X** | | | | | | | |
| | | Define Td scale: _____ - _____ (°C) | | | | | | | | | | |
| | | **-50...+50 °C Td, DRYCAP®180S (for refrigerator dryers)** | | | **S** | | | | | | | |
| | | **Free scaling Td °C, DRYCAP®180S (for refrigerator dryers)** | | | **Y** | | | | | | | |
| | | Define Td scale: _____ - _____ (°C) | | | | | | | | | | |
| 2 | Analog Output Cable | **No cable - connector only** | | | | **1** | | | | | | |
| | | **2m (6.6 ft) Connection cable with DMT242 valve connector** | | (221475SP) | | **2** | | | | | | $40 |
| | | **10 m (33 ft) Connection cable with DMT242 valve connector** | | (221476SP) | | **3** | | | | | | $70 |
| 3 | Pressure setting for optimized accuracy | **1 bar abs** | **(14.5 psi abs)** | | | | **A** | | | | | |
| | | **3 bar abs** | **(43.5 psi abs)** | | | | **B** | | | | | |
| | | **5 bar abs** | **(72.5 psi abs)** | | | | **C** | | | | | |
| | | **7 bar abs** | **(101.5 psi abs)** | | | | **D** | | | | | |
| | | **special (max 20 bar abs)** | Define value: _____ bar abs | | | | **X** | | | | | |
| 4 | Sensor protection | **Stainless steel sintered filter (37 um)** | | | | | | **1** | | | | |
| | | **Stainless steel filter for vacuum (below 0.5 bar abs)** | | | | | | **2** | | | | |
| 5 | PC accessories | **None** | | | | | | | **A** | | | |
| | | *Serial interface cable for service use, DMT242RS* | | | | | | | *B* | | | $50 |
| 6 | Installation accessories | **None** | | | | | | | | **0** | | |
| | | *Basic sampling cell* | | (DMT242SC) | | | | | | *1* | | $80 |
| | | *Sampling cell, swagelok 1/4" male connectors* | | (DMT242SC2) | | | | | | *2* | | $100 |
| | | *Sampling cell with quick connector and leak screw* | | (DSC74) | | | | | | *3* | | $100 |
| | | *Two pressure sampling cell* | | (DSC74B) | | | | | | *4* | | $220 |
| | | *Two pressure sampling cell with coil* | | (DSC74C) | | | | | | *5* | | $340 |
| | | *NPT 1/2" adapter* | | (210662) | | | | | | *6* | | $25 |
| | | *Duct installation flange* | | (DM240FA) | | | | | | *9* | | $80 |
| 7 | User's guide | **None** | | | | | | | | | **A** | |
| | | **English** | | | | | | | | | **B** | |
| | | **French** | | | | | | | | | **D** | |
| | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | QTY | |
| | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| DMT242 | A | 1 | D | 1 | A | 0 | B |
|---|---|---|---|---|---|---|---|

| Accessories: | Description | Order Code | Price |
|---|---|---|---|
| | Loop-powered display<br>4…20mA/-80…20 °C Tdf, Nokeval 301 | 226476 | $250 |



## DM70 Hand-held Dewpoint Meter

| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala DRYCAP® Hand-held Dewpoint Meter** | | | **DM70** | | | | | | | | | |
| 1 | Indicator type | no indicator* | | | A | | | | | | | | |
| | | rechargable with Euro AC-adapter | | | B | | | | | | | | $840 |
| | | rechargable with US AC-adapter | | (MI70USADAPTER+26755) | D | | | | | | | | $840 |
| | | alkaline batteries only | | (18950 (4 pieces)) | K | | | | | | | | $780 |
| 2 | Indicator accessories | **no indicator accessories** | | | | **0** | | | | | | | |
| | | *MI70Link (software with RS232 cable)* | | (MI70LINK) | | *1* | | | | | | | $60 |
| | | *analog output-signal cable* | | (27168ZZ) | | *2* | | | | | | | $35 |
| | | *MI70Link and analog output-signal cable* | | (MI70LINK + 27168ZZ) | | *3* | | | | | | | $95 |
| | | *MI70LINK software with USB cable* | | (219687) | | *5* | | | | | | | $90 |
| 3 | Probe type | *DMP74A -40…+60 °C Td* | | | | | *A* | | | | | | $1,630 |
| | | *DMP74B -60…+20 °C Td* | | | | | *B* | | | | | | $1,630 |
| | | *DMP74C -50…+20 °C Td (for SF6 gas)* | | | | | *C* | | | | | | $2,410 |
| 4 | Probe accessories | **no accessories** | | | | | | **0** | | | | | |
| | | *sample cell (quick connect & leak screw)* | | (DSC74) | | | | *1* | | | | | $100 |
| | | *portable sampling system with case* | | (DSS70A) | | | | *2* | | | | | $1,560 |
| | | *sample cell (no fittings)* | | (DMT242SC) | | | | *3* | | | | | $80 |
| | | *sample cell (with swagelock connectors)* | | (DMT242SC2) | | | | *4* | | | | | $100 |
| | | *two-pressure sample cell* | | (DSC74B) | | | | *5* | | | | | $220 |
| | | *two-pressure sample cell with coil* | | (DSC74C) | | | | *6* | | | | | $340 |
| 5 | Connection cable to a transmitter | **no connection cable** | | | | | | | **A** | | | | |
| | | *connection cable to DMT242 transmitter* | | (27160ZZ) | | | | | *B* | | | | $60 |
| | | *connection cable to DMP248 transmitter* | | (27159ZZ) | | | | | *C* | | | | $60 |
| | | *connection cable to DMT142 transmitter* | | (211917ZZ) | | | | | *D* | | | | $60 |
| | | *connection cable to DMT340 transmitter* | | (211339) | | | | | *E* | | | | $60 |
| | | *connection cables to DMP248 & DMT242 & DMT142 & DMT340* | | | | | | | *M* | | | | $140 |
| 6 | Carrying case | **no carrying case**** | | | | | | | | **0** | | | |
| | | *carrying case (Black ABS), for one probe* | | (MI70CASE) | | | | | | *1* | | | $140 |
| | | *carrying case (Aluminium), for two probes* | | (MI70CASE2) | | | | | | *2* | | | $200 |
| 7 | Manual language | **No manual** | | | | | | | | | **A** | | |
| | | **English** | | | | | | | | | **B** | | |
| 8 | Special Features | **Standard** | | | | | | | | | | **1** | |
| | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | TOTAL VALUE | |

* select item A, if only probe is ordered
** select item 0, if portable sampling system is selected

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| DM70 | D | 5 | B | 0 | A | 1 | B | 1 |
|---|---|---|---|---|---|---|---|---|

| Accessories and Spare Parts: | Description | Order Code | PRICE |
|---|---|---|---|
| | 10m extension cable for probe | 213107SP | $60 |
| | SS sample cooling coil | DMCOIL | $120 |
| | SS sintered filter 12mm diameter | HM47280SP | $50 |
| | SS filter guard for vacuum applications | HM47453SP | $50 |
| | US Adapter | MI70USADAPTER | $60 |
| | Battery NiMH 4.8 for MI70 | 26755 | $30 |

# MMT332 Moisture and Temperature Transmitter for Oil

**for high pressure applications**

| | | |

## MMT338 Moisture and Temperature Transmitter for Oil

**For pressurized pipelines**

| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Humidity and Temperature Transmitter** | | | | **MMT330** | **8** | | **0** | | | | | | | | | | | | | **2** | | | | | **A** | **1** | PRICE |
| 1 | **Transmitter type** | **MMT338** | | | | **8** | | | | | | | | | | | | | | | | | | | | | | $2,180 |
| 2 | **Probe cable length** | **2 m cable (6.6 ft) for standard probe** | | | | | **V** | | | | | | | | | | | | | | | | | | | | | |
| | | *5 m cable (16.4 ft) for standard probe* | | | | | W | | | | | | | | | | | | | | | | | | | | | $160 |
| | | *10 m cable (32.8 ft) for standard probe* | | | | | X | | | | | | | | | | | | | | | | | | | | | $370 |
| | | *2 m cable (6.6 ft) for long probe* | | | | | 1 | | | | | | | | | | | | | | | | | | | | | $120 |
| | | *5 m cable (16.4 ft) for long probe* | | | | | 2 | | | | | | | | | | | | | | | | | | | | | $260 |
| | | *10 m cable (32.8 ft) for long probe* | | | | | 3 | | | | | | | | | | | | | | | | | | | | | $460 |
| 3 | **-----** | **None** | | | | | | **0** | | | | | | | | | | | | | | | | | | | | |
| 4 | **Measurement parameters** | **aw+T** | | | | | | | **E** | | | | | | | | | | | | | | | | | | | |
| 5 | **Display** | **No display** | | | | | | | | **0** | | | | | | | | | | | | | | | | | | |
| | | *Graphic LCD with backlight* | | | | | | | | 1 | | | | | | | | | | | | | | | | | | $320 |
| 6 | **Power supply** | **10...35 VDC 24 VAC** | | (HMT300PWS) | | | | | | | **0** | | | | | | | | | | | | | | | | | |
| | | *Galvanic isolation for outputs 10...35 VDC 24 VAC* | | (DcDc-1) | | | | | | | 1 | | | | | | | | | | | | | | | | | $80 |
| | | *Universal AC -power (100....240 VAC)* | | (Power-1) | | | | | | | 2 | | | | | | | | | | | | | | | | | $200 |
| | | *Universal AC -power (100....240 VAC) + US -power cord* | | (Power-1 and 215991) | | | | | | | 3 | | | | | | | | | | | | | | | | | $210 |
| | | *External US AC-adapter (for LAN/WLAN interface in USA and Canada)* | | Not IP65 | | | | | | | 9 | | | | | | | | | | | | | | | | | $60 |
| 7 | **Analog output** | **4... 20 mA** | | | | | | | | | | **1** | | | | | | | | | | | | | | | | |
| | | **0... 20 mA** | | | | | | | | | | **2** | | | | | | | | | | | | | | | | |
| | | **0... 1 V** | | | | | | | | | | **3** | | | | | | | | | | | | | | | | |
| | | **0... 5 V** | | | | | | | | | | **4** | | | | | | | | | | | | | | | | |
| | | **0... 10 V** | | | | | | | | | | **5** | | | | | | | | | | | | | | | | |
| 8 | **Analog output** | **No 3rd analog output** | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| 9 | **parameter and scaling** | **T** | | **(range: see below)** | | | | | | | | | **C** | **C** | | | | | | | | | | | | | **C** | |
| 10 | **for Ch1&Ch2(&Ch3)** | **aw (0...1)** | | **(0...1)** | | | | | | | | | **P** | **P** | | | | | | | | | | | | | **P** | |
| | **SPECIAL** | Define parameter (unit) for Ch1:_____(_____) Ch2:_____(_____) Optional Ch3:_____(_____) | | | | | | | | | | | **X** | **X** | | | | | | | | | | | | | **X** | |
| | | Define scale for Ch1:_____ Ch2:_____ Optional Ch3:_____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Channel 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Channel 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Channel 3, choose A, if not needed | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Analog output range** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | **for temperature** | **-40...+60°C** | | **(-40...+140°F)** | | | | | | | | | | | | | | | | | | | | | | | **B** | |
| | **NOTE:** | **-40...+80°C** | | **(-40...+176°F)** | | | | | | | | | | | | | | | | | | | | | | | **C** | |
| | **- Choose option A, if no** | **-40...+120°C** | | **(-40...+248°F)** | | | | | | | | | | | | | | | | | | | | | | | **D** | |
| | **T output is desired** | **-40...+180°C** | | **(-40...+356°F)** | | | | | | | | | | | | | | | | | | | | | | | **E** | |
| | | **-20...+60°C** | | **(-4...+140°F)** | | | | | | | | | | | | | | | | | | | | | | | **F** | |
| | | **-20...+80°C** | | **(-4...+176°F)** | | | | | | | | | | | | | | | | | | | | | | | **G** | |
| | | **-20...+120°C** | | **(-4...+248°F)** | | | | | | | | | | | | | | | | | | | | | | | **H** | |
| | | **-20...+180°C** | | **(-4...+356°F)** | | | | | | | | | | | | | | | | | | | | | | | **J** | |
| | | **0...+60°C** | | **(+32...+140°F)** | | | | | | | | | | | | | | | | | | | | | | | **K** | |
| | | **0...+100°C** | | **(+32...+ 212°F)** | | | | | | | | | | | | | | | | | | | | | | | **L** | |
| | | **0...+120°C** | | **(+32...248°F)** | | | | | | | | | | | | | | | | | | | | | | | **M** | |
| | | **0...+180°C** | | **(+32...356°F)** | | | | | | | | | | | | | | | | | | | | | | | **N** | |
| | | **-60...60 °C** | | **(-76...+140°F)** | | | | | | | | | | | | | | | | | | | | | | | **P** | |
| | **SPECIAL** | _____**°C /** _____**F** | | | | | | | | | | | | | | | | | | | | | | | | | **X** | |
| 12 | **Output units** | **Metric** | | | | | | | | | | | | | | | | | | | | | | | | | | **1** |
| | | **Non-metric** | | | | | | | | | | | | | | | | | | | | | | | | | | **2** |
| 13 | **Additional feature** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | | **0** |
| | | *Relay output* | | (Relay-1) | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | *RS-485 galvanic isolation* | | (RS485-1) | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| | | *LAN (Ethernet) interface + 2 m cable (RJ45)* | | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| | | *WLAN (Wireless Ethernet) interface + antenna* | | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| | | *Data logging module*)* | | | | | | | | | | | | | | | | | | | | | | | | | | 6 |
| 14 | **Additional feature 2** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | | **0** |
| | | *Relay output* | | (Relay-1) | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | *3rd Analog output Choose also analog output signal for Ch3* | | (AOUT-1) | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| | | *Data logging module*)* | | | | | | | | | | | | | | | | | | | | | | | | | | 6 |
| 15 | **Interface cable connection** | **Cable gland (for 8...11mm cable)** | **(for 0.315...0.433 inch cable)** | (214728SP) | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | | **Conduit fitting for wire conduit (NPT1/2")** | | (214780SP) | | | | | | | | | | | | | | | | | | | | | | | B | |
| | | *Connector (M12, 8 pin) and plug with 5m cable* | | (212142) | | | | | | | | | | | | | | | | | | | | | | | C | |
| | | *Connector (M12, 8 pin) and plug (screw terminal)* | | (212416) | | | | | | | | | | | | | | | | | | | | | | | D | |
| 16 | **Transmitter housing** | **Wall Mounting** | | | | | | | | | | | | | | | | | | | | | | | | | | **0** |
| | **installation** | *Wall mounting plate (for adapting to HMP228)* | | (214829) | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | *Pipe / pole installation* | | (215108) | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| | | *Pipe / pole installation with rain shield* | | (215109) | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| | | *DIN-rail installation* | | (215094) | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| 17 | **Sensor** | **Special sensor for fluids** | | | | | | | | | | | | | | | | | | | | | | | | | | **2** |
| 18 | **Sensor protection** | **Stainless steel grid** | | (HM47453SP) | | | | | | | | | | | | | | | | | | | | | | | **D** | |
| | | **Stainless steel grid (for applications with linear flow > 1 m/s)** | | (220752) | | | | | | | | | | | | | | | | | | | | | | | **E** | |
| 19 | **Probe installation** | *Ball valve set* | | (DRW212076 + BALLVALVE-1) | | | | | | | | | | | | | | | | | | | | | | | *M* | |
| | **accessories** | **Pressure fitting NPT1/2** | | (NPTFITBODASAP) | | | | | | | | | | | | | | | | | | | | | | | **N** | |
| | | **Pressure fitting ISO 1/2** | | (DRW212076) | | | | | | | | | | | | | | | | | | | | | | | V | |
| 20 | **User's guide** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | | **English** | | (M210566EN) | | | | | | | | | | | | | | | | | | | | | | | **B** | |
| 21 | **PC Accessories** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | | *Service cable for PC* | | (19446ZZ) | | | | | | | | | | | | | | | | | | | | | | | B | |
| | | *MI70LINK software for Windows + service cable for PC* | | (215005) | | | | | | | | | | | | | | | | | | | | | | | C | |
| | | *Service cable for PC, USB* | | (219685) | | | | | | | | | | | | | | | | | | | | | | | D | |
| | | MI70LINK software for Windows® + USB service cable for PC | | (219916) | | | | | | | | | | | | | | | | | | | | | | | E | |
| 22 | **Calibration** | **ISO9001 compliant calibration (factory calibration)** | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| 23 | **-----** | **None** | | | | | | | | | | | | | | | | | | | | | | | | | | **1** |

*) Choose data logging module only once (option 11 or 12)

TOTAL

QTY

TOTAL VALUE

**Selections in bold are included in the prices of the basic versions.**

*Selections in italic are available at an extra price.*

Shaded sections indicate typical selections.

**Example of order code with typical settings:**

| MMT330 | 8 | V | 0 | E | 1 | 0 | 1 | P | C | A | L | 2 | 0 | 0 | A | 0 | 2 | D | N | B | A | A | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



## MM70 Hand-Held Moisture Meter for Oil

| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Hand-held Moisture Meter for Oil** | | **MM70** | **1** | **A** | **1** | **A** | | **A** | | | | | | | **0** | PRICE |
| 1 | Indicator type | no indicator * | A | | | | | | | | | | | | | | | |
| | | rechargeable with Euro AC-adapter | B | | | | | | | | | | | | | | | $840 |
| | | rechargeable with US AC-adapter | (MI70USADAPTER+26755) D | | | | | | | | | | | | | | | $840 |
| | | alkaline batteries only | (18950) (4 pieces) K | | | | | | | | | | | | | | | $780 |
| 2 | Reserved for future use | | | **1** | | | | | | | | | | | | | | |
| 3 | Probe type | **MMP78** | | | **A** | | | | | | | | | | | | | $2,080 |
| 4 | Sensor | **Special sensor for fluids** | (HUMICAP180L2) | | | **1** | | | | | | | | | | | | |
| 5 | Filter | **Stainless steel filter** | (HM47453SP) | | | | **A** | | | | | | | | | | | |
| 6 | Indicator accessories | **no indicator accessories** | | | | | | **0** | | | | | | | | | | |
| | | *MI70LINK (software with RS 232 cable)* | (MI70LINK) | | | | | *1* | | | | | | | | | | $60 |
| | | *Analog output-signal cable* | (27168ZZ) | | | | | *2* | | | | | | | | | | $35 |
| | | *MI70LINK and analog output-signal cable* | (MI70LINK + 27168ZZ) | | | | | *3* | | | | | | | | | | $95 |
| | | *MI70LINK software with USB cable* | (219687) | | | | | *5* | | | | | | | | | | $90 |
| 7 | Calibration | **at room temperature** | | | | | | | **A** | | | | | | | | | |
| 8 | Installation accessories | **no accessories** | | | | | | | | **0** | | | | | | | | |
| | | *Ball valve set (incl. fitting body + blanking plug)* | (DRW212076 + BALLVALVE-1) | | | | | | | *1* | | | | | | | | $80 |
| | | *Connecting adapter to NPT ½"* | (210662) | | | | | | | *2* | | | | | | | | $30 |
| 9 | Measured variables | *aw+T* | | | | | | | | | **A** | | | | | | | |
| 10 | Connection cable | **no connection cable** | | | | | | | | | | **0** | | | | | | |
| | to a transmitter | *Connection cable to HMP228* | (27159ZZ) | | | | | | | | | *1* | | | | | | $60 |
| | | *Connection cable to MMT318* | (DRW216050) | | | | | | | | | *2* | | | | | | $60 |
| | | *Connectioin cable to MMT300 Series* | (211339) | | | | | | | | | *3* | | | | | | $60 |
| 11 | Probe cable length | **1.9 meter** | | | | | | | | | | | | **A** | | | | |
| | | *1.9 meter + extension cable 10m* | (213107) | | | | | | | | | | | *B* | | | | $60 |
| 12 | Carrying case | **no carrying case** | | | | | | | | | | | | | **0** | | | |
| | | *Aluminum carrying case for indicator and 2 probes* | (211402) | | | | | | | | | | | | *1* | | | $200 |
| 13 | Manual language | **No manual** | | | | | | | | | | | | | | **A** | | |
| | | **English** | | | | | | | | | | | | | | **B** | | |
| 14 | Reserved for future use | | | | | | | | | | | | | | | | **0** | |

TOTAL

QTY

TOTAL VALUE

* select item A, if only probe is ordered

** check the availability and special delivery time from your local Vaisala representative.

**Selections in bold are included in the prices of the basic versions**.

*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| MM70 | D | 1 | A | 1 | A | 5 | A | 0 | A | 0 | A | 1 | B | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Accessories and Spare Parts:**

| Description: | Order Code: | PRICE |
|---|---|---|
| Manual press tool | HM36854SP | $30 |
| Plastic wrench | DRW216040SP | $30 |
| Calibration adapter for HMK15 | 211302 | $30 |
| Protecting cap MM78 | DRW215988SP | $30 |
| Cable extension 10m | 213107SP | $60 |
| Ball valve assembly | BALLVALVE-1 | $80 |
| Battery NiMH 4.8 for the MI70 | 26755 | $30 |
| MI70 US Adapter | MI70USADAPTER | $60 |

## Vaisala CARBOCAP® Carbon Dioxide Probe GMP343

| | Vaisala CARBOCAP® Carbon Dioxide Probe | GMP343 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sampling method | **diffusion** | **A** | | | | | | | | | | | $2,800 |
| | | **flow through** | **B** | | | | | | | | | | | $3,090 |
| 2 | Measurement range of the probe: | **0…1000 ppm $CO_2$** | | **1** | | | | | | | | | | |
| | | **0…2000 ppm $CO_2$** | | **2** | | | | | | | | | | |
| | | **0…3000 ppm $CO_2$** | | **3** | | | | | | | | | | |
| | | **0...4000 ppm $CO_2$** | | **4** | | | | | | | | | | |
| | | **0...5000 ppm $CO_2$ *** | | **5** | | | | | | | | | | |
| | | **0…2 % $CO_2$ *** | | **6** | | | | | | | | | | |
| 3 | Analog output selection ** | **0...5V** | | | **A** | | | | | | | | | |
| | | **0...2.5 V** | | | **B** | | | | | | | | | |
| | | **4...20 mA** | | | **C** | | | | | | | | | |
| 4 | Digital output selection | **RS-232** | | | | **1** | | | | | | | | |
| | | **RS-485 ***** | | | | **2** | | | | | | | | |
| 5 | Probe cable | **none** | | | | | **N** | | | | | | | |
| | | *probe cable (with M12 type female connector), 2 m* | | | | | *A* | | | | | | | $40 |
| | | *probe cable (with M12 type female connector), 6 m* | | | | | *B* | | | | | | | $50 |
| | | *probe cable (with M12 type female connector), 10 m* | | | | | *C* | | | | | | | $60 |
| 6 | Measurement indicator MI70 and accessories | **none** | | | | | | **0** | | | | | | |
| | | *MI70 indicator and interface cable, 2 m**** | | | | | | 1 | | | | | | $860 |
| | | *MI70 interface cable, 2 m* | | | | | | 2 | | | | | | $60 |
| 7 | Calibration accessories | **none** | | | | | | | **N** | | | | | |
| | | *calibration adapter for diffusion model.* | | | | | | | *A* | | | | | $120 |
| | | *PC connection kit*****| | | | | | | *B* | | | | | $80 |
| | | *calibration adapter for diffusion model and PC connection kit*****| | | | | | | *C* | | | | | $200 |
| 8 | Mounting accessories | **none** | | | | | | | | **0** | | | | |
| | | *mounting flange* | | | | | | | | *1* | | | | $80 |
| 9 | Wiring accessories | **none** | | | | | | | | | **N** | | | |
| | | *junction box* | | | | | | | | | *A* | | | $40 |
| 10 | Reserved for future use | | | | | | | | | | | **0** | | |
| 11 | Manual | **no manual** | | | | | | | | | | | **A** | |
| | | **English** | | | | | | | | | | | **B** | |
| | | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

**Notes:**

* The range 0...5000 ppm $CO_2$ and 0…2 % $CO_2$ have reduced accuracy specifications above 4000 ppm $CO_2$.

** The analog output type may be selected and re-scaled using PC connection cable.

*** If the selection is RS-485, the device may be powered up in the RS-232 service mode for user settings. See user manual for details.

****This selection includes:

- MI70 indicator with a rechargeable battery
- AC adapter with AUS, EUR, UK and US plugs
- MI70Link software with RS232 cable (PC<->MI70)
- 2 m interface cable (GMP343 <-> MI70)

***** PC connecton kit includes PC connection cable (213379) and USB adapter (USB-D9 Serial connection Cable, 219686)

| GMP343 | A | 1 | A | 1 | A | O | A | O | N | 0 | B |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Accessories and Spare Parts: | Description | Order Code | PRICE |
|---|---|---|---|
| Included in the default configuration ---------- | Wall mount bracket | GMP343BRACKET | $60 |
| | Mounting flange | GMP343FLANGE | $110 |
| Included in the default configuration ---------- | Standard diffusion filter (IP65) + filter cover | GMP343FILTER | $80 |
| of the diffusion model | Diffusion filter (sintered filter, IP66) + filter cover | 215521 | $120 |
| | Calibration adapter | GMP343ADAPTER | $120 |
| | Junction box | JUNCTIONBOX-8 | $50 |
| | Probe cable (with M12 type female conn.), 2 meter | GMP343Z200SP | $50 |
| | Probe cable (with M12 type female conn.), 6 meter | GMP343Z600SP | $70 |
| | Probe cable (with M12 type female conn.), 10 meter | GMP343Z1000SP | $80 |
| | PC connection cable | 213379 | $80 |
| | Interface cable for MI70, 2 meter | DRW216050SP | $60 |
| | USB adapter (USV-D9 Serial connection cable) | 219686 | $90 |
| | Soil adapter kit for horizontal positioning (includes PTFE filter) | 215519 | $150 |
| | Soil adapter kit for vertical positioning (includes PTFE filter) | 215520 | $150 |



## GMT221 and GMT222 $CO_2$ Transmitters

| | Vaisala CARBOCAP® $CO_2$ Transmitter | | GM | T | 22 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Vaisala CARBOCAP® CO2 Transmitter | | | | | | | | | | | | | | | | | $840 |
| 1 | PROBE: Measurement range (GMT221) | **0…2 %$CO_2$** | | | | **1** | **H** | | | | | | | | | | | |
| | | **0…3 %$CO_2$** | | | | **1** | **J** | | | | | | | | | | | |
| | | **0…5 %$CO_2$** | | | | **1** | **K** | | | | | | | | | | | |
| | | **0...10 %$CO_2$** | | | | **1** | **L** | | | | | | | | | | | |
| | | **0...20 %$CO_2$** | | | | **1** | **M** | | | | | | | | | | | |
| 2 | (GMT222) | **0…2000 ppm$CO_2$** adjusted at 1000 ppm (* | | | | **2** | **B** | | | | | | | | | | | |
| | | **0…2000 ppm$CO_2$** | | | | ***2*** | **C** | | | | | | | | | | | |
| | | **0...3000 ppm$CO_2$** | | | | ***2*** | **D** | | | | | | | | | | | |
| | | **0...5000 ppm$CO_2$** | | | | ***2*** | **E** | | | | | | | | | | | |
| | | **0…7000 ppm$CO_2$** | | | | ***2*** | **F** | | | | | | | | | | | |
| | | **0…10000 ppm$CO_2$** | | | | ***2*** | **G** | | | | | | | | | | | |
| 3 | Place holder for future option, not available at this time | | | | | | | **0** | | | | | | | | | | |
| 4 | Probe installation accessories | **none** | | | | | | | **N** | | | | | | | | | |
| | | *mounting clips, 2 pcs* | (25245GMSP) | | | | | | *A* | | | | | | | | | $10 |
| | | *mounting flange* | (GM45156SP) | | | | | | *B* | | | | | | | | | $50 |
| 5 | Field check adapter | **none** | | | | | | | | **0** | | | | | | | | |
| | | *adapter* | (26150GM) | | | | | | | *1* | | | | | | | | $70 |
| 6 | Display on cover | **LED lights only** | | | | | | | | | **A** | | | | | | | |
| | | *LED lights + backlit digital LCD display* | | | | | | | | | *B* | | | | | | | $120 |
| 7 | Place holder for future option, not available at this time | | | | | | | | | | | **0** | | | | | | |
| 8 | Wall/remote use | **probe in transmitter (wall model)** | | | | | | | | | | | **N** | | | | | |
| | | *probe with 2 m cable (remote installation of probe)* | (25665GMSP) | | | | | | | | | | *A* | | | | | $80 |
| | | *probe with 10 m cable (remote installation of probe)* | (210848GMSP) | | | | | | | | | | *C* | | | | | $100 |
| 9 | TRANSMITTER UNIT: Alarm relay 1 | **setpoint not activated** | | | | | | | | | | | | **1** | | | | |
| | | **custom setpoint for relay 1_____ ppm / % $CO_2$** | | | | | | | | | | | | **X** | | | | |
| | | Example: custom setpoint for relay 1 1000 ppm $CO_2$ | | | | | | | | | | | | | | | | |
| | | -> Relay will be activated above 1000 ppm $CO_2$ | | | | | | | | | | | | | | | | |
| 10 | Alarm relay 2 | **setpoint not activated** | | | | | | | | | | | | | **A** | | | |
| | | **custom setpoint for relay 2_____ ppm / % $CO_2$** | | | | | | | | | | | | | **X** | | | |
| | | Example: custom setpoint for relay 2 4% $CO_2$ | | | | | | | | | | | | | | | | |
| | | -> Relay will be activated above 4% $CO_2$ | | | | | | | | | | | | | | | | |
| 11 | Accessories | **no accessories** | | | | | | | | | | | | | | **0** | | |
| | | *Serial COM adapter* | (19040GM) | | | | | | | | | | | | | *1* | | $100 |
| 12 | Manual | **no manual** | | | | | | | | | | | | | | | **A** | |
| | | **English** | | | | | | | | | | | | | | | **B** | |
| | (* special accuracy specification | | | | | | | | | | | | | | | TOTAL | | |
| | | | | | | | | | | | | | | | | QTY | | |
| | | | | | | | | | | | | | | | | TOTAL VALUE | | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

Examples of order codes with typical settings:

Transmitter with probe

| GM | T | 22 | 1 | L | 0 | N | 0 | B | 0 | N | 1 | A | 0 | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Accessories and Spare Parts: | Description: | Order Code: | PRICE |
|---|---|---|---|
| | In-soil adapter kit | 211921GM | $60 |
| | Goretex membrane spare filter plus cap for GMP221 | 25378GMSP | $50 |
| | Goretex membrane spare filter plus cap for GMP222 | 25879GMSP | $50 |
| | Calibration Kit for interchangeable probes | GMK220 | $1,600 |

## GM70 Hand-held Carbon Dioxide Meter

| | Vaisala CARBOCAP® Hand-held $CO_2$ Meter | | GM70 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Indicator type | **no indicator *** | | **A** | | | | | | | | | |
| | | rechargeable with Euro AC-adapter | | B | | | | | | | | | $840 |
| | | *rechargeable with US AC-adapter* | | *D* | | | | | | | | | $840 |
| 2 | Indicator accessories | **no indicator accessories** | | | **0** | | | | | | | | |
| | | *MI70LINK (software with RS232 cable)* | | | *1* | | | | | | | | $60 |
| | | *analog output signal cable* | (27168ZZ) | | *2* | | | | | | | | $35 |
| | | *MI70LINK and analog output-signal cable* | (MI70LINK+ 27168ZZ) | | *3* | | | | | | | | $95 |
| | | *MI70LINK software with USB cable* | (219687) | | *4* | | | | | | | | $90 |
| 3 | Accessories for transmitter checking | **no indicator cables** | | | | **A** | | | | | | | |
| | | *adapter cable for transmitters)* | (GMA70) | | | *B* | | | | | | | $160 |
| 4 | Sampling method | *diffusion (handle GMH70)* | | | | | *1* | | | | | | $900 |
| | | *pump (GM70PUMP) + Nafion® membrane tubing* | (212807GM) | | | | *2* | | | | | | $1,580 |
| 5 | Measurement range of interchangeable probe: | **0…2000 ppm $CO_2$** | | | | | | **C** | | | | | |
| | | **0…3000 ppm $CO_2$** | | | | | | **D** | | | | | |
| | | **0...5000 ppm $CO_2$** | | | | | | **E** | | | | | |
| | | **0…7000 ppm $CO_2$** | | | | | | **F** | | | | | |
| | | **0…10000 ppm $CO_2$** | | | | | | **G** | | | | | |
| | | **0…2 % $CO_2$** | | | | | | **H** | | | | | |
| | | **0...3 % $CO_2$** | | | | | | **J** | | | | | |
| | | **0...5 % $CO_2$** | | | | | | **K** | | | | | |
| | | **0...10 % $CO_2$** | | | | | | **L** | | | | | |
| | | **0...20 % $CO_2$** | | | | | | **M** | | | | | |
| 6 | Probe accessories | **no accessories** | | | | | | | **0** | | | | |
| | | *field check adapter* | (26150GM) | | | | | | *1* | | | | $70 |
| 7 | Space holder for future option | | | | | | | | | A | | | |
| 8 | Carrying case | **no carrying case** | | | | | | | | | **0** | | |
| | | *carrying case* | (MI70CASE) | | | | | | | | *1* | | $140 |
| 9 | Manual | **no manual** | | | | | | | | | | **A** | |
| | | **English manual** | | | | | | | | | | **B** | |
| | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | TOTAL VALUE | |

* select item A, only if the handle or pump with probe is ordered

**Selections in bold are included in the purchase price.**

*Items in italics are available at an additional cost.*
Shaded options indicate most typical selections.

Example of an order code with typical settings:

| GM70 | D | 4 | A | 1 | M | 1 | A | 1 | B |
|---|---|---|---|---|---|---|---|---|---|

| Accessories and Spare Parts: | Description: | Order Code: | PRICE |
|---|---|---|---|
| | US Adapter | MI70USADAPTER | $60 |
| | Battery NiMH 4.8 battery for MI70 | 26755 | $30 |
| | Pump for GM70 Hand-held CO2 meter | GM70PUMP | $1,050 |
| | Handle for GM70 | GMH70 | $440 |
| | Nafion® membrane tubing | 212807GM | $200 |



## OMT355 Oxygen Transmitter

| | Vaisala SPECTRACAP® Oxygen Transmitter OMT355 | | | OMT355 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 1 | A | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Installation type | **In-line (range 0... 25 %$O_2$)** | **with a flange adapter for in-line mounting** | | | | | **A** | | | | | | | | | | | | | $4,850 |
| | | **Ambient environment (range 2...25 %$O_2$)** | **with a wall mounting bracket** | *(216653)* | | | | **B** | | | | | | | | | | | | | $4,850 |
| | | Sample cell (range 0... 25 %$O_2$) | *with a sample cell and a wall mounting bracket* | | | | | *C* | | | | | | | | | | | | | $5,690 |
| | | In-line (range 0... 100 %$O_2$)* | *with a flange adapter for in-line mounting* | | | | | *D* | | | | | | | | | | | | | $5,200 |
| | | Sample cell (range 0... 100 %$O_2$)* | *with a sample cell and a wall mounting bracket* | | | | | *E* | | | | | | | | | | | | | $6,060 |
| 2 | Filter type | | **No filter (sample cell installation)** | | | | | | **1** | | | | | | | | | | | | |
| | | | *Stainless steel net* | *(216615)* | | | | | *2* | | | | | | | | | | | | $160 |
| | NOTE: | PTFE filter non-compatible for 100% $O_2$ | *PTFE filter with stainless steel net* | | | | | | *3* | | | | | | | | | | | | $290 |
| 3 | Analog output range for oxygen (can be reconfigured in the field) | | **$O_2$ (0...5%)** | | | | | | **A** | | | | | | | | | | | | |
| | | | **$O_2$ (0...10%)** | | | | | | **B** | | | | | | | | | | | | |
| | | | **$O_2$ (0...15%)** | | | | | | **C** | | | | | | | | | | | | |
| | | | **$O_2$ (0...20%)** | | | | | | **D** | | | | | | | | | | | | |
| | | | **$O_2$ (0...25%)** | | | | | | **E** | | | | | | | | | | | | |
| | | | **$O_2$ (0...100%)** | | | | | | **K** | | | | | | | | | | | | |
| | **SPECIAL:** | **Define $O_2$ special range from** | **_____%$O_2$ to _____%$O_2$** | | | | | | **X** | | | | | | | | | | | | |
| 4 | Signal output (can be reconfigured in the field)** | | **4...20 mA** | | | | | | | **1** | | | | | | | | | | | |
| | | | **0...20 mA** | | | | | | | **2** | | | | | | | | | | | |
| 5 | Fault state current for analog output (can be reconfigured in the field)** | | **3 mA or below** | | | | | | | | **A** | | | | | | | | | | |
| | | | **21 mA or higher** | | | | | | | | **B** | | | | | | | | | | |
| | NOTE: | Fault state 3 mA can be chosen only if signal output is 4...20 mA | | | | | | | | | | | | | | | | | | | |
| 6 | Relay settings Setpoint: _____ %$O_2$ (hysteresis 1%$O_2$) (can be reconfigured in the field)** | | **Relay opens ONLY when fault state occurs** | | | | | | | | | **1** | | | | | | | | | |
| | | | **Relay opens when $O_2$ value decreases below setpoint** | | | | | | | | | **X** | | | | | | | | | |
| | | | **Relay opens when $O_2$ value increases above setpoint** | | | | | | | | | **Y** | | | | | | | | | |
| 7 | Material of sample wetted O-rings | | **EPDM** | | | | | | | | | | **A** | | | | | | | | |
| | | | *Kalrez* | | | | | | | | | | *B* | | | | | | | | $980 |
| 8 | Cable bushings | | **Cable gland M20x1.5** (cable diameter 8... 11 mm) | *(214728SP)* | | | | | | | | | | **1** | | | | | | | |
| | | | **Conduit fitting NPT1/2** (inner threads) | *(217197)* | | | | | | | | | | **2** | | | | | | | |
| | | | *Connector (8 pin M12 male) with 2m cable* | *(GMP343Z200SP)* | | | | | | | | | | *3* | | | | | | | $40 |
| | | | *Connector (8 pin M12 male) with 6m cable* | *(GMP343Z600SP)* | | | | | | | | | | *4* | | | | | | | $50 |
| | | | *Connector (8 pin M12 male) with 10m cable* | *(GMP343Z1000SP)* | | | | | | | | | | *5* | | | | | | | $60 |
| 9 | In-line calibration option | | **no** | | | | | | | | | | | | **A** | | | | | | |
| | | | *Calibration gas inlet with check valve* | | | | | | | | | | | | *B* | | | | | | $640 |
| 10 | Accessories | | **None** | | | | | | | | | | | | | **1** | | | | | |
| | | | *Serial interface cable for PC* | *(19446ZZ)* | | | | | | | | | | | | *2* | | | | | $40 |
| 11 | User's guide language | | **no user's guide** | | | | | | | | | | | | | | **A** | | | | |
| | | | **English** | | | | | | | | | | | | | | **B** | | | | |
| 12 | Calibration | | **ISO 9001 compliant factory calibration** | | | | | | | | | | | | | | | **1** | | | |
| 13 | Maintenance and repair | | **Standard maintenance and repair** | | | | | | | | | | | | | | | | **A** | | |
| | | | | | | | | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | | | | | | | | TOTAL VALUE | |

*Oxygen compatibility certification delivered with the 0…100%$O_2$ range

**Requires a Serial Interface Cable and Terminal programme on PC

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

Example of order code with typical settings:

| OMT355 | A | 2 | B | 1 | A | 1 | A | 1 | A | 1 | B | 1 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Spare parts & accessories**

| Item | Order code | PRICE |
|---|---|---|
| Stainless steel net | 216615 | $170 |
| PTFE filter with EPDM O-ring | 217055 | $125 |
| PTFE filter with Kalrez O-ring | 217056 | $215 |
| Flange adapter with EPDM O-ring | 217053 | $165 |
| Flange adapter with Kalrez O-ring | 217054 | $385 |
| Wall mounting bracket | 216653 | $120 |
| Sample/calibration cell with EPDM | 217052 | $915 |
| Sample/calibration cell with Kalrez | 216619 | $1,220 |
| Cable gland | 214728SP | $15 |

| Item | Order code | PRICE |
|---|---|---|
| Conduit fitting NPT1/2 (inner threads) | 217197 | $35 |
| Connector for transmitter body | 214806SP | $25 |
| EPDM O-rings for sample cell | 217198 | $60 |
| Kalrez O-rings for sample cell | 217199 | $315 |
| Connection cable, 2 m | GMP343Z200SP | $40 |
| Connection cable, 6 m | GMP343Z600SP | $50 |
| Connection cable, 10 m | GMP343Z1000SP | $60 |
| Junction box for 8-pole cable | junctionbox-8 | $50 |
| Serial interface cable for PC | 19446ZZ | $40 |
| EPDM flange adapter gasket | 216347 | $25 |
| Kalrez flange adapter gasket | 216833 | $40 |

# OMT364 Nonincendive Oxygen Transmitter

| | Vaisala SPECTRACAP® Oxygen Transmitter OMT364 | | | OMT 360 | 4 | | | | | | | | | | 1 | A | 1 | A | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Transmitter type | | OMT364 | | 4 | | | | | | | | | | | | | | |
| 2 | Installation type | **In-line (range 0... 25 %$O_2$)** | **with a flange adapter for in-line mounting** | | | A | | | | | | | | | | | | | $7,400 |
| | | **Ambient environment (range 2...25 %$O_2$)** | **with a wall mounting bracket** | *(216653)* | | B | | | | | | | | | | | | | $7,400 |
| | | Sample cell (range 0... 25 %$O_2$) | *with a sample cell and a wall mounting bracket* | | | C | | | | | | | | | | | | | $8,240 |
| 3 | Filter type | | **No filter (sample cell installation)** | | | | 1 | | | | | | | | | | | | |
| | | | *Stainless steel net* | *(216615)* | | | 2 | | | | | | | | | | | | $160 |
| | | | *PTFE filter with stainless steel net* | | | | 3 | | | | | | | | | | | | $290 |
| 4 | Analog output range for oxygen | | **$O_2$ (0...5%)** | | | | | A | | | | | | | | | | | |
| | (can be reconfigured in the field) | | **$O_2$ (0...10%)** | | | | | B | | | | | | | | | | | |
| | | | **$O_2$ (0...15%)** | | | | | C | | | | | | | | | | | |
| | | | **$O_2$ (0...20%)** | | | | | D | | | | | | | | | | | |
| | | | **$O_2$ (0...25%)** | | | | | E | | | | | | | | | | | |
| | SPECIAL: | **Define $O_2$ special range from** | _____%$O_2$ | **to** _____%$O_2$ | | | | X | | | | | | | | | | | |
| | NOTE: | Specifications are valid only for measurement range 0...25%$O_2$ | | | | | | | | | | | | | | | | | |
| 5 | Signal output | | **4...20 mA** | | | | | | 1 | | | | | | | | | | |
| | (can be reconfigured in the field)* | | **0...20 mA** | | | | | | 2 | | | | | | | | | | |
| 6 | Fault state current for analog output | | **3 mA or below** | | | | | | | A | | | | | | | | | |
| | (can be reconfigured in the field)* | | **21 mA or higher** | | | | | | | B | | | | | | | | | |
| | NOTE: | Fault state 3 mA can be chosen only if signal output is 4...20 mA | | | | | | | | | | | | | | | | | |
| 7 | Relay settings | | **Relay opens ONLY when fault state occurs** | | | | | | | | 1 | | | | | | | | |
| | Setpoint: _____ %$O_2$ | | **Relay opens when $O_2$ value decreases below setpoint** | | | | | | | | 2 | | | | | | | | |
| | Setpoint: _____ %$O_2$ | | **Relay opens when $O_2$ value increases above setpoint** | | | | | | | | 3 | | | | | | | | |
| | Define selected custom setpoint when required. Factory setpoint is 10%$O_2$, hysteresis is 1%$O_2$ | | | | | | | | | | | | | | | | | | |
| 8 | Cable bushings | | **Cable gland M20x1.5**** | (cable diameter 8... 11 mm) | *(214728SP)* | | | | | | | A | | | | | | | |
| | | | **Conduit fitting NPT1/2** | (inner threads) | *(217197)* | | | | | | | B | | | | | | | |
| 9 | In-line calibration option | | **no** | | | | | | | | | | 1 | | | | | | |
| | | | *Calibration gas inlet with check valve* | | | | | | | | | | 2 | | | | | | $640 |
| 10 | User's guide language | | **no user's guide** | | | | | | | | | | | A | | | | | |
| | | | **English** | | | | | | | | | | | B | | | | | |
| 11 | Approval | | **FM (USA, Canada)** | | | | | | | | | | | | 1 | | | | |
| 12 | | | | | | | | | | | | | | | | A | | | |
| 13 | | | | | | | | | | | | | | | | | 1 | | |
| 14 | | | | | | | | | | | | | | | | | | A | |
| | | | | | | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | | | | | | TOTAL VALUE | |

*Requires a Serial Interface Cable and Terminal programme on PC. Reconfiguration should be done only in a safe area

**Cable gland usable only in the USA according to FM approval

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

Example of order code with typical settings:

| OMT360 | 4 | A | 2 | B | 1 | A | 1 | A | 1 | B | 1 | A | 1 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Spare parts & accessories**

| Item | Order code | PRICE | |
|---|---|---|---|
| Stainless steel net | 216615 | $170 | |
| PTFE filter with Kalrez O-ring | 217056 | $215 | |
| Flange adapter with Kalrez O-ring | 217054 | $385 | |
| Wall mounting bracket | 216653 | $120 | |
| Sample/calibration cell with Kalrez | 216619 | $1,220 | |
| Conduit fitting | 217197 | $35 | |
| Kalrez O-rings for sample cell/flange adaptor | 217199 | $315 | |
| Serial interface cable for PC | 19446ZZ | $40 ..... | Note! For safe area use only. |
| USB-RJ45 Serial Interface Cable | 219685 | $90 ..... | Note! For safe area use only. |
| Cable gland | 214728SP | $15 | |
| Kalrez Flange adaptor gasket | 216833 | $40 | |



# Vaisala Pressure, Humidity and Temperature Transmitter PTU301 - Wall Mount

| Item | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Vaisala Pressure, Humidity and Temperature Transmitter** | | **PTU300** | 1 | | A | 0 | | | | | | | | 1 | | | | | | | | 0 | | | A | PRICE |
| | **Transmitter type** | **PTU301** | | 1 | | | | | | | | | | | | | | | | | | | | | | | $2,070 |
| 2 | **Pressure range** | *500...1100 hPa* | | | | | | | | | | | | | | | | | | | | | | | | | $200 |
| | | **500...1100 hPa** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *500...1100 hPa* | | | | | | | | | | | | | | | | | | | | | | | | | $620 |
| | | *500...1100 hPa* | | | | | | | | | | | | | | | | | | | | | | | | | $420 |
| | | **50...1100 hPa** | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *50...1100 hPa* | | | | | | | | | | | | | | | | | | | | | | | | | $420 |
| 3 | **Wall mount probe** | **fixed** | | | | | | A | | | | | | | | | | | | | | | | | | | |
| | | with short cable | | | | | | 8 | | | | | | | | | | | | | | | | | | | |
| 4 | **Additional temperature probe** | **No probe** | | | | | | 0 | | | | | | | | | | | | | | | | | | | |
| 5 | **Display** | **No display** | | | | | | | 0 | | | | | | | | | | | | | | | | | | |
| | | *Graphic LCD with backlight* | | | | | | | 1 | | | | | | | | | | | | | | | | | | $320 |
| 6 | **Power supply** | **10...35 VDC, 24 VAC** | | | | | | | | A | | | | | | | | | | | | | | | | | |
| | | *Galvanic isolation for outputs 10...35 VDC 24 VAC* | | | | | | | | B | | | | | | | | | | | | | | | | | $80 |
| | | *Universal AC power (100....240 VAC)* | (POWER-1) | | | | | | | C | | | | | | | | | | | | | | | | | $200 |
| | | *Universal AC power (100....240 VAC) + US power cord* | (POWER-1 AND 215991) | | | | | | | D | | | | | | | | | | | | | | | | | $210 |
| | | *External US AC-adapter (for LAN/WLAN interface in USA and Canada)* | Not IP65 | | | | | | | K | | | | | | | | | | | | | | | | | $60 |
| 7 | **Output signal** | **RS232C only, No Analog output** | Mandatory with two pressure sensors | | | | | | | | 0 | | | | | | | | | | | | | | | | |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | ***4...20 mA*** | | | | | | | | *1* | | | | | | | | | | | | | | | | $190 |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **0... 20 mA** | | | | | | | | *2* | | | | | | | | | | | | | | | | $190 |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **0... 1 V** | | | | | | | | *3* | | | | | | | | | | | | | | | | $190 |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **0... 5 V** | | | | | | | | *4* | | | | | | | | | | | | | | | | $190 |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **0... 10 V** | | | | | | | | *5* | | | | | | | | | | | | | | | | $190 |
| | **Parameter and scaling for analog output (Ch1, Ch2, Ch3)** | **No Analog output** | | | | | | | | | | A | A | A | | | | | | | | | | | | | |
| | | **RH** | **(0...100 %RH)** | | | | | | | | | B | B | | | | | | | | | | | | | | |
| | | **T** | **(range: see below)** | | | | | | | | | C | C | | | | | | | | | | | | | | |
| | | **Td (-20...100 °C)** | **(-4...+212 °F)** | | | | | | | | | D | D | | | | | | | | | | | | | | |
| | | **Tdf (-20...100 °C)** | **(-4...+212 °F)** | | | | | | | | | E | E | | | | | | | | | | | | | | |
| | | **a (0...600 g/m3)** | **(0...262 gr/ft3)** | | | | | | | | | F | F | | | | | | | | | | | | | | |
| | | **Tw (0...100 °C)** | **(+32...+212 °F)** | | | | | | | | | G | G | | | | | | | | | | | | | | |
| | | **x (0...500 g/kg d.a)** | **(0...3500 gr/lb)** | | | | | | | | | H | H | | | | | | | | | | | | | | |
| | | **h (-40...1500 kJ/kg)** | **(-9.5...+652.6 Btu/lb)** | | | | | | | | | J | J | | | | | | | | | | | | | | |
| | | **pw (0...1000 hPa)** | **(0...14.5 psi)** | | | | | | | | | K | K | | | | | | | | | | | | | | |
| | | **pws (0...1000 hPa)** | **(0...14.5 psi)** | | | | | | | | | L | L | | | | | | | | | | | | | | |
| | | **dT (-10...+50 °C)** | **(14...+122 °F)** | | | | | | | | | M | M | | | | | | | | | | | | | | |
| | | **P** | **(pressure range: selection in item 2)** | | | | | | | | | | P | | | | | | | | | | | | | | |
| | **Special** | **Define quantity for Ch1:**_____ **Ch2:**_____ | | | | | | | | | | X | X | X | | | | | | | | | | | | | |
| | | **Define scale for Ch1:**_____ **Ch2:**_____ **Ch3:**_____ | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | Channel 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | Channel 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | Channel 3 only for pressure | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Analog output range for temperature** | **No analog output** | | | | | | | | | | | | A | | | | | | | | | | | | | |
| | Note: Select option A, if T output is not required | **-40...+60 °C** | **(-40...+140 °F)** | | | | | | | | | | | B | | | | | | | | | | | | | |
| | | **-20...+60 °C** | **(-4...+140 °F)** | | | | | | | | | | | F | | | | | | | | | | | | | |
| | | **0...+60 °C** | **(+32...+140 °F)** | | | | | | | | | | | K | | | | | | | | | | | | | |
| | | **special range :** _____ | | | | | | | | | | | | X | | | | | | | | | | | | | |
| 12 | **Output format** | **Standard** | | | | | | | | | | | | | 1 | | | | | | | | | | | | |
| 13 | **Output units** | **Metric** | | | | | | | | | | | | | | A | | | | | | | | | | | |
| | | **Non-metric** | | | | | | | | | | | | | | B | | | | | | | | | | | |
| 14 | **Optional module** | **No module** | Mandatory with two pressure sensors or analog output | | | | | | | | | | | | | | 0 | | | | | | | | | | |
| | | *Relay output* | (RELAY-1) -Not possible with power supply module | | | | | | | | | | | | | | *1* | | | | | | | | | | $180 |
| | | *RS485 serial interface (galvanically isolated)* | (RS485-1) | | | | | | | | | | | | | | *2* | | | | | | | | | | $160 |
| | | *LAN (Ethernet) interface + 2 m cable (RJ45)* | Not possible with Universal AC power | | | | | | | | | | | | | | *4* | | | | | | | | | | $260 |
| | | *WLAN (Wireless Ethernet) interface + antenna* | With short cable probe only | | | | | | | | | | | | | | *5* | | | | | | | | | | $320 |
| | | *Data logger module* | | | | | | | | | | | | | | | *6* | | | | | | | | | | $350 |
| 15 | **Cable bushings** | **Cable gland (for 8...11 mm cable) (for 0.315...0.433 inch cable)** | (214728SP) | | | | | | | | | | | | | | | A | | | | | | | | |
| | Note: The universal AC power must not be connected through the 8-pole connector or D9 adapter | **Conduit fitting NPT1/2"** | (214780SP) | | | | | | | | | | | | | | | B | | | | | | | | |
| | | *8-pole connector with 5m cable* | (212142) | | | | | | | | | | | | | | | *C* | | | | | | | | | $60 |
| | | *8-pole counter connector with screw terminals* | (212416) | | | | | | | | | | | | | | | *D* | | | | | | | | | $60 |
| | | *D9-adapter* | Only for RS232C, RS485 and DC supply | | | | | | | | | | | | | | | *E* | | | | | | | | | $70 |
| 16 | **Pressure fitting** | **Barbed fitting for 1/8" hose** | (19498) | | | | | | | | | | | | | | | | 1 | | | | | | | | |
| | | *Quick connector with shutoff valve for 1/8" hose* | (19886, 25328 + 25329) | | | | | | | | | | | | | | | | *2* | | | | | | | | $40 |
| 17 | **Transmitter installation** | **Normal mounting** | | | | | | | | | | | | | | | | | | A | | | | | | | |
| | | *Wall mounting plate* | (214829) | | | | | | | | | | | | | | | | | *B* | | | | | | | $90 |
| | | *Pole installation kit* | (215108) | | | | | | | | | | | | | | | | | *C* | | | | | | | $100 |
| | | *Pole installation kit with Rain Shield* | (215109) | | | | | | | | | | | | | | | | | *D* | | | | | | | $110 |
| | | *DIN rail kit* | (215094) | | | | | | | | | | | | | | | | | *E* | | | | | | | $90 |
| | | *Probe holder plate Recommended with short cable probe* | (226252) | | | | | | | | | | | | | | | | | *F* | | | | | | | $90 |
| 18 | **Humidity sensor** | **General purpose** | **HUMICAP180** | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| | | *Chemical purge* | *HUMICAP180C* | | | | | | | | | | | | | | | | | | *4* | | | | | | $60 |
| | | **General purpose and high chemical concentrations** | **HUMICAP180R** | | | | | | | | | | | | | | | | | | A | | | | | | |
| | | *Chemical purge* | HUMICAP180RC | | | | | | | | | | | | | | | | | | *C* | | | | | | $60 |
| 19 | **Sensor protection** | **PPS plastic grid & stainless steel netting** | (DRW010281SP) | | | | | | | | | | | | | | | | | | | B | | | | | |
| | | **PPS plastic grid** | (DRW010276SP) | | | | | | | | | | | | | | | | | | | C | | | | | |
| | | **Sintered stainless steel filter** | (HM47280SP) | | | | | | | | | | | | | | | | | | | D | | | | | |
| | | **Stainless steel grid** | HM47453SP | | | | | | | | | | | | | | | | | | | E | | | | | |
| 20 | **Probe installation accessories** | **No probe installation accessories** | | | | | | | | | | | | | | | | | | | | | 0 | | | | |
| 21 | **User's Guide language** | **No manual** | | | | | | | | | | | | | | | | | | | | | | A | | | |
| | | **English** | | | | | | | | | | | | | | | | | | | | | | B | | | |
| 22 | **PC Accessories** | **No** | | | | | | | | | | | | | | | | | | | | | | | 0 | | |
| | | *Service cable for PC* | (19446ZZ) | | | | | | | | | | | | | | | | | | | | | | *1* | | $40 |
| | | *MI70LINK software for Windows® with RS232 service cable* | (215005) | | | | | | | | | | | | | | | | | | | | | | *2* | | $60 |
| | | *Service cable for PC, USB software driver* | (219685) | | | | | | | | | | | | | | | | | | | | | | *3* | | $90 |
| | | *MI70LINK software for Windows® with USB service cable* | (219916) | | | | | | | | | | | | | | | | | | | | | | *4* | | $90 |
| 23 | **Calibration Certificate** | **ISO9001 compliant factory calibration / No Calibration Contract** | | | | | | | | | | | | | | | | | | | | | | | | A | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*
Shaded sections indicate typical selections.

TOTAL
QTY
TOTAL VALUE

**Example of order code with typical settings:**

| PTU300 | 1 | 1 | A | 0 | 0 | A | 1 | B | C | P | B | 1 | B | 0 | A | 1 | A | A | B | 0 | B | 0 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Vaisala Pressure, Humidity and Temperature Transmitter PTU303 - Outdoor Use

| Item | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Vaisala Pressure, Humidity and Temperature Transmitter** | | | **PTU300** | **3** | | | **0** | | | | | | | | **1** | | | | | | | | | | | | **A** | **PRICE** |
| | **Transmitter type** | **PTU303** | **for general use** | | **3** | | | | | | | | | | | | | | | | | | | | | | | | $2,110 |
| 2 | **Pressure range** | *500...1100 hPa* | *Class A / one sensor* | | *1* | | | | | | | | | | | | | | | | | | | | | | | | $200 |
| | | **500...1100 hPa** | **Class B / one sensor** | | **2** | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *500...1100 hPa* | *Class A / two sensors* | | *3* | | | | | | | | | | | | | | | | | | | | | | | | $620 |
| | | *500...1100 hPa* | *Class B / two sensors* | | *4* | | | | | | | | | | | | | | | | | | | | | | | | $420 |
| | | **50...1100 hPa** | **One sensor, class B only** | | **5** | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *50...1100 hPa* | *Two sensors, class B only* | | *6* | | | | | | | | | | | | | | | | | | | | | | | | $420 |
| 3 | **Probe cable length** | **2 m cable** | | | | | **B** | | | | | | | | | | | | | | | | | | | | | | |
| | | *5 m cable* | | | | | *C* | | | | | | | | | | | | | | | | | | | | | | $150 |
| | | *10 m cable* | | | | | *D* | | | | | | | | | | | | | | | | | | | | | | $300 |
| 4 | **Additional temperature probe** | **No probe** | | | | | | **0** | | | | | | | | | | | | | | | | | | | | | |
| 5 | **Display** | **No display** | | | | | | **0** | | | | | | | | | | | | | | | | | | | | | |
| | | *Graphic LCD with backlight* | | | | | | *1* | | | | | | | | | | | | | | | | | | | | | $320 |
| 6 | **Power supply** | **10...35 VDC, 24 VAC** | (HMT300PWS) | | | | | | *A* | | | | | | | | | | | | | | | | | | | | |
| | | *Galvanic isolation for outputs 10...35 VDC 24 VAC* | (DCDC-1) | | | | | | *B* | | | | | | | | | | | | | | | | | | | | $80 |
| | | *Universal AC power (100....240 VAC)* | (POWER-1) | | | | | | *C* | | | | | | | | | | | | | | | | | | | | $200 |
| | | *Universal AC power (100....240 VAC) + US power cord* | (POWER-1 AND 215991) | | | | | | *D* | | | | | | | | | | | | | | | | | | | | $210 |
| | | *External US AC-adapter (for LAN/WLAN interface in USA and Canada)* | | Not IP65 | | | | | *K* | | | | | | | | | | | | | | | | | | | | $60 |
| 7 | **Output signal** | **RS232C only, No Analog output** | Mandatory with two pressure sensors | | | | | | | **0** | | | | | | | | | | | | | | | | | | | |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3)* | **4... 20 mA** | | | | | | | *1* | | | | | | | | | | | | | | | | | | | $190 |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3)* | **0... 20 mA** | | | | | | | *2* | | | | | | | | | | | | | | | | | | | $190 |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3)* | **0... 1 V** | | | | | | | *3* | | | | | | | | | | | | | | | | | | | $190 |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3)* | **0... 5 V** | | | | | | | *4* | | | | | | | | | | | | | | | | | | | $190 |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3)* | **0... 10 V** | | | | | | | *5* | | | | | | | | | | | | | | | | | | | $190 |
| | **Parameter and scaling for analog output (Ch1, Ch2, Ch3)** | **No Analog output** | | | | | | | | | **A** | **A** | **A** | | | | | | | | | | | | | | | | |
| | | **RH** | **(0...100 %RH)** | | | | | | | | **B** | **B** | | | | | | | | | | | | | | | | | |
| | | **T** | **(range: see below)** | | | | | | | | **C** | **C** | | | | | | | | | | | | | | | | | |
| | | **Td (-20...100 °C)** | **(-4...+212 °F)** | | | | | | | | **D** | **D** | | | | | | | | | | | | | | | | | |
| | | **Tdf (-20...100 °C)** | **(-4...+212 °F)** | | | | | | | | **E** | **E** | | | | | | | | | | | | | | | | | |
| | | **a (0...600 g/m3)** | **(0...262 gr/ft3)** | | | | | | | | **F** | **F** | | | | | | | | | | | | | | | | | |
| | | **Tw (0...100 °C)** | **(+32...+212 °F)** | | | | | | | | **G** | **G** | | | | | | | | | | | | | | | | | |
| | | **x (0...500 g/kg d.a)** | **(0...3500 gr/lb)** | | | | | | | | **H** | **H** | | | | | | | | | | | | | | | | | |
| | | **h (-40...1500 kJ/kg)** | **(-9.5...+652.6 Btu/lb)** | | | | | | | | **J** | **J** | | | | | | | | | | | | | | | | | |
| | | **pw (0...1000 hPa)** | **(0...14.5 psi)** | | | | | | | | **K** | **K** | | | | | | | | | | | | | | | | | |
| | | **pws (0...1000 hPa)** | **(0...14.5 psi)** | | | | | | | | **L** | **L** | | | | | | | | | | | | | | | | | |
| | | **dT (-10...+50 °C)** | **(14...+122 °F)** | | | | | | | | **M** | **M** | | | | | | | | | | | | | | | | | |
| | | **P** | **(pressure range: selection in item 2)** | | | | | | | | | | **P** | | | | | | | | | | | | | | | | |
| | **Special** | | **Define quantity for Ch1:**_____ **Ch2:**_____ | | | | | | | | **X** | **X** | **X** | | | | | | | | | | | | | | | | |
| | | | **Define scale for Ch1:**_____ **Ch2:**_____ **Ch3:**_____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | Channel 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | Channel 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | Channel 3 only for pressure | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Analog output range for temperature** | **No analog output** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | | **-40...+60 °C** | **(-40...+140 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | **B** | |
| | Note: Select option A, | **-20...+60 °C** | **(-4...+140 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | **F** | |
| | if T output is not required | **0...+60 °C** | **(+32...+140 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | **K** | |
| | | | **special range :**_____ | | | | | | | | | | | | | | | | | | | | | | | | | **X** | |
| 12 | **Output format** | **Standard** | | | | | | | | | | | | | | **1** | | | | | | | | | | | | | |
| 13 | **Output units** | **Metric** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | | **Non-metric** | | | | | | | | | | | | | | | | | | | | | | | | | | **B** | |
| 14 | **Optional module** | **No module** | Mandatory with two pressure sensors or analog output | | | | | | | | | | | | | | | | | | | | | | | | | | **0** |
| | | *Relay output* | (RELAY-1) -Not possible with power supply module | | | | | | | | | | | | | | | | | | | | | | | | | | *1* |
| | | *RS485 serial interface (galvanically isolated)* | (RS485-1) | | | | | | | | | | | | | | | | | | | | | | | | | | *2* |
| | | *LAN (Ethernet) interface + 2 m cable (RJ45)* | | | | | | | | | | | | | | | | | | | | | | | | | | | *4* |
| | | *WLAN (Wireless Ethernet) interface + antenna* | | | | | | | | | | | | | | | | | | | | | | | | | | | *5* |
| | | *Data logger module* | | | | | | | | | | | | | | | | | | | | | | | | | | | *6* |
| 15 | **Cable bushings** | **Cable gland (for 8...11 mm cable) (for 0.315...0.433 inch cable)** | (214728SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Note: The universal AC power | **Conduit fitting NPT1/2"** | (214780SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | must not be connected | *8-pole connector with 5m cable* | (212142) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | through the 8-pole connector | *8-pole counter connector with screw terminals* | (212416) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | or D9 adapter | *D9-adapter* | *Only for RS232C, RS485 and DC supply* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | **Pressure fitting** | **Barbed fitting for 1/8" hose** | (19498) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Quick connector with shutoff valve for 1/8" hose* | (19886, 25328 + 25329) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | **Transmitter installation** | **Normal mounting** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Wall mounting plate* | (214829) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Pole installation kit* | (215108) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Pole installation kit with Rain Shield* | (215109) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *DIN rail kit* | (215094) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | **Humidity sensor** | **General purpose** | **HUMICAP180** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Chemical purge* | *HUMICAP180C* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **General purpose and high chemical concentration** | **HUMICAP180R** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Chemical purge* | *HUMICAP180RC* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | **Sensor protection** | **PPS plastic grid & stainless steel netting** | (DRW010281SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **PPS plastic grid** | (DRW010276SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **Sintered stainless steel filter** | (HM47280SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **Stainless steel grid** | (HM47453SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | **Probe installation accessories** | **No kit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Duct Installation kit* | (210697) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Cable Gland AGRO* | (HMP247CG) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | **User's Guide language** | **No manual** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **English** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | **PC Accessories** | **No** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Service cable for PC* | (19446ZZ) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *MI70LINK software for Windows® with RS232 service cable* | (215005) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Service cable for PC, USB software driver* | (219685) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *MI70LINK software for Windows® with USB service cable* | (219916) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | **Calibration Certificate** | **ISO9001 compliant factory calibration / No Calibration Contract** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |

**Selections in bold are included in the prices of the basic versions.** TOTAL
*Selections in italic are available at an extra price.* QTY
Shaded sections indicate typical selections. TOTAL VALUE

**Example of order code with typical settings**

| PTU300 | 3 | 1 | B | 0 | 0 | A | 1 | B | C | P | B | 1 | B | 0 | A | 1 | A | A | B | 0 | B | 0 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Additional Accessories: Description** | **Order Code** | **PRICE**

Outdoor Solar Radiation Shield | DTR502B | $310



## Vaisala Pressure, Humidity and Temperature Transmitter PTU307 - Warmed Probe

| Item | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Vaisala Pressure, Humidity and Temperature Transmitter** | | | **PTU300** | **7** | | | | | | | | | | | **1** | | | | | | | | | | | | **A** | **PRICE** |
| | **Transmitter type** | **PTU307** | **for high humidity** | | **7** | | | | | | | | | | | | | | | | | | | | | | | | $3,100 |
| 2 | **Pressure range** | *500...1100 hPa* | *Class A / one sensor* | | *1* | | | | | | | | | | | | | | | | | | | | | | | | $200 |
| | | **500...1100 hPa** | **Class B / one sensor** | | **2** | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *500...1100 hPa* | *Class A / two sensors* | | *3* | | | | | | | | | | | | | | | | | | | | | | | | $620 |
| | | *500...1100 hPa* | *Class B / two sensors* | | *4* | | | | | | | | | | | | | | | | | | | | | | | | $420 |
| | | **50...1100 hPa** | **One sensor, class B only** | | **5** | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *50...1100 hPa* | *Two sensors, class B only* | | *6* | | | | | | | | | | | | | | | | | | | | | | | | $420 |
| 3 | **Probe cable length** | **2m cable** | | | | | | | **E** | | | | | | | | | | | | | | | | | | | | |
| | | *5 m cable* | | | | | | | *F* | | | | | | | | | | | | | | | | | | | | $160 |
| | | *10 m cable* | | | | | | | *G* | | | | | | | | | | | | | | | | | | | | $370 |
| 4 | **Additional temperature probe** | **No probe** | | | | | | **0** | | | | | | | | | | | | | | | | | | | | | |
| | | *2 m cable* | | | | | | *1* | | | | | | | | | | | | | | | | | | | | | $160 |
| | | *5 m cable* | | | | | | *2* | | | | | | | | | | | | | | | | | | | | | $180 |
| | | *10 m cable* | | | | | | *3* | | | | | | | | | | | | | | | | | | | | | $220 |
| 5 | **Display** | **No display** | | | | | | **0** | | | | | | | | | | | | | | | | | | | | | |
| | | *Graphic LCD with backlight* | | | | | | *1* | | | | | | | | | | | | | | | | | | | | | $320 |
| 6 | **Power supply** | **10...35 VDC, 24 VAC** | (HMT300PWS) | | | | | | **A** | | | | | | | | | | | | | | | | | | | | |
| | | *Galvanic isolation for outputs 10...35 VDC 24 VAC* | (DCDC-1) | | | | | | *B* | | | | | | | | | | | | | | | | | | | | $80 |
| | | *Universal AC power (100....240 VAC)* | (POWER-1) | | | | | | *C* | | | | | | | | | | | | | | | | | | | | $200 |
| | | *Universal AC power (100....240 VAC) + US power cord* | (POWER-1 AND 215991) | | | | | | *D* | | | | | | | | | | | | | | | | | | | | $210 |
| | | *External US AC-adapter (for LAN/WLAN interface in USA and Canada)* | | Not IP65 | | | | | *K* | | | | | | | | | | | | | | | | | | | | $60 |
| 7 | **Output signal** | **RS232C only, No Analog output** | Mandatory with two pressure sensors | | | | | | | **0** | | | | | | | | | | | | | | | | | | | |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3* | **4... 20 mA** | | | | | | | *1* | | | | | | | | | | | | | | | | | | | $190 |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3* | **0... 20 mA** | | | | | | | *2* | | | | | | | | | | | | | | | | | | | $190 |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3* | **0... 1 V** | | | | | | | *3* | | | | | | | | | | | | | | | | | | | $190 |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3* | **0... 5 V** | | | | | | | *4* | | | | | | | | | | | | | | | | | | | $190 |
| | | **RS232C** + *Optional Analog output (Ch1, Ch2, Ch3* | **0... 10 V** | | | | | | | *5* | | | | | | | | | | | | | | | | | | | $190 |
| | **Parameter and scaling for analog output (Ch1, Ch2, Ch3)** | **No Analog output** | | | | | | | | | **A** | **A** | **A** | | | | | | | | | | | | | | | | |
| | | **RH** | **(0...100 %RH)** | | | | | | | | **B** | **B** | | | | | | | | | | | | | | | | | |
| | | **T** | **(range: see below)** | | | | | | | | **C** | **C** | | | | | | | | | | | | | | | | | |
| | | **Td (-20...100 °C)** | **(-4...+212 °F)** | | | | | | | | **D** | **D** | | | | | | | | | | | | | | | | | |
| | | **Tdf (-20...100 °C)** | **(-4...+212 °F)** | | | | | | | | **E** | **E** | | | | | | | | | | | | | | | | | |
| | | **a (0...600 g/m3)** | **(0...262 gr/ft3)** | | | | | | | | **F** | **F** | | | | | | | | | | | | | | | | | |
| | | **Tw (0...100 °C)** | **(+32...+212 °F)** | | | | | | | | **G** | **G** | | | | | | | | | | | | | | | | | |
| | | **x (0...500 g/kg d.a)** | **(0...3500 gr/lb)** | | | | | | | | **H** | **H** | | | | | | | | | | | | | | | | | |
| | | **h (-40...1500 kJ/kg)** | **(-9.5...+652.6 Btu/lb)** | | | | | | | | **J** | **J** | | | | | | | | | | | | | | | | | |
| | | **pw (0...1000 hPa)** | **(0...14.5 psi)** | | | | | | | | **K** | **K** | | | | | | | | | | | | | | | | | |
| | | **pws (0...1000 hPa)** | **(0...14.5 psi)** | | | | | | | | **L** | **L** | | | | | | | | | | | | | | | | | |
| | | **dT (-10...+50 °C)** | **(14...+122 °F)** | | | | | | | | **M** | **M** | | | | | | | | | | | | | | | | | |
| | | **P** | **(pressure range: selection in item 2)** | | | | | | | | | | **P** | | | | | | | | | | | | | | | | |
| | **Special** | | **Define quantity for Ch1:**_____ **Ch2:**_____ | | | | | | | | **X** | **X** | **X** | | | | | | | | | | | | | | | | |
| | | | **Define scale for Ch1:**_____ **Ch2:**_____ **Ch3:**_____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | Channel 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | Channel 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | Channel 3 only for pressure | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Analog output range for temperature** | **No analog output** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | | **-40...+60 °C** | **(-40...+140 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | **B** | |
| | Note: Select option A, | **-20...+60 °C** | **(-4...+140 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | **F** | |
| | if T output is not required | **0...+60 °C** | **(+32...+140 °F)** | | | | | | | | | | | | | | | | | | | | | | | | | **K** | |
| | | | **special range :**_____ | | | | | | | | | | | | | | | | | | | | | | | | | **X** | |
| 12 | **Output format for serial interface** | **Standard** | | | | | | | | | | | | | | | | | | | | | | | | | | | **1** |
| 13 | **Output units** | **Metric** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | | **Non-metric** | | | | | | | | | | | | | | | | | | | | | | | | | | **B** | |
| 14 | **Optional module** | **No module** | Mandatory with two pressure sensors or analog output | | | | | | | | | | | | | | | | | | | | | | | | | | **0** |
| | | *Relay output* | (RELAY-1) -Not possible with power supply module | | | | | | | | | | | | | | | | | | | | | | | | | | *1* |
| | | *RS485 serial interface (galvanically isolated)* | (RS485-1) | | | | | | | | | | | | | | | | | | | | | | | | | | *2* |
| | | *LAN (Ethernet) interface + 2 m cable (RJ45)* | | | | | | | | | | | | | | | | | | | | | | | | | | | *4* |
| | | *WLAN (Wireless Ethernet) interface + antenna* | | | | | | | | | | | | | | | | | | | | | | | | | | | *5* |
| | | *Data logger module* | | | | | | | | | | | | | | | | | | | | | | | | | | | *6* |
| 15 | **Cable bushings** | **Cable gland (for 8...11 mm cable) (for 0.315...0.433 inch cable)** | (214728SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Note: The universal AC power | **Conduit fitting NPT1/2"** | (214780SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | must not be connected | *8-pole connector with 5m cable* | (212142) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | through the 8-pole connector | *8-pole counter connector with screw terminals* | (212416) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | or D9 adapter | *D9-adapter* | *Only for RS232C, RS485 and DC supply* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | **Pressure fitting** | **Barbed fitting for 1/8" hose** | (19498) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Quick connector with shutoff valve for 1/8" hose* | (19886, 25328 + 25329) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | **Transmitter installation** | **Normal mounting** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Wall mounting plate* | (214829) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Pole installation kit* | (215108) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Pole installation kit with Rain Shield* | (215109) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *DIN rail kit* | (215094) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | **Humidity sensor** | **Composite sensor** | **HUMICAP180C** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Chemical purge* | HUMICAP180C | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **General purpose and high chemical concentrations** | **HUMICAP180RC** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Chemical purge* | HUMICAP180RC | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | **Sensor protection** | **PPS plastic grid & stainless steel netting** | (DRW010281SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **PPS plastic grid** | (DRW010276SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **Sintered stainless steel filter** | (HM47280SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **Stainless steel grid** | (HM47453SP) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | **Probe installation accessories** | **No kit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Duct Installation kit* | (210697) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Cable Gland AGRO* | (HMP247CG) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *2 x Duct installation kits (RH+T probes)* | (210697 + 215003) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | **User's Guide language** | **No manual** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | **English** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | **PC Accessories** | **No** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Service cable for PC* | (19446ZZ) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *MI70LINK software for Windows® with RS232 service cable* | (215005) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *Service cable for PC, USB software driver* | (219685) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | *MI70LINK software for Windows® with USB service cable* | (219916) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | **Calibration Certificate** | **ISO9001 compliant factory calibration / No Calibration Contract** | | | | | | | | | | | | | | | | | | | | | | | | | | **A** | |

**Selections in bold are included in the prices of the basic versions.** TOTAL
*Selections in italic are available at an extra price.* QTY
Shaded sections indicate typical selections. TOTAL VALUE

**Example of order code with typical settings:**

| PTU300 | 7 | 1 | E | 1 | 0 | A | 1 | B | C | P | B | 1 | B | 0 | A | 1 | B | A | B | 0 | B | 0 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

### Vaisala Meteorological Installation Kit for PTU300 Transmitters

| | | | | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala Meteorological Installation Kit** | **HMT330MIK** | | | | | | | PRICE |
| 1 | Support bar & shield for warmed Td probe | **No support bar & shield for warmed Td probe** | | **0** | | | | | |
| | | *Support bar, transmitter mounting plate & shield for warmed Td probe* | | *1* | | | | | $580 |
| 2 | Support bar and radiation shield for additional T probe or for non-warmed RH or Td probe | **No support bar or radiation shield** | | **A** | | | | | |
| | | *Support bar with DTR502 shield for T probe* | | *B* | | | | | $580 |
| | | *Support bar with DTR13 shield for T probe* | | *C* | | | | | $920 |
| | | *Support bar with DTR502 shield for non-warmed RH or Td probe* | | *D* | | | | | $580 |
| | | *Support bar with DTR13 shield for non-warmed RH or Td probe* | | *E* | | | | | $920 |
| 3 | Support bar mounting plate | **No mounting plate** | | **0** | | | | | |
| | | *Pole mounting plate for support bar/bars* | | *1* | | | | | $120 |
| 4 | Additional transmitter mounting plate | **No additional transmitter mounting plate** | | **A** | | | | | |
| | | *Transmitter mounting plate for support bar assembly* | | *B* | | | | | $110 |
| | | *Transmitter mounting plate for pole assembly* | | *C* | | | | | $110 |
| 5 | Static Pressure Head | **No Static Pressure Head** | | | | | | **0** | |
| | | *Static Pressure Head SPH10* | | | | | | *1* | $270 |

Selections in **bold** are included in the prices of the basic versions TOTAL
*Selections in italic have an additional cost* QTY
Shaded sections indicate typical selections. TOTAL VALUE

Example of order code with typical settings:

| HMT330MIK | 1 | B | 1 | A | 0 |
|---|---|---|---|---|---|

## Vaisala Pressure and Temperature Transmitter PTU30T - Temperature only

| Item | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **VAISALA Pressure and Temperature Transmitte** | | **PTU300** | **T** | | | **0** | | | | | | | | **1** | | | | | | **0** | **A** | **0** | | | | |
| | **Transmitter type** | **PTU30T** | **for pressure and temperature only** | **T** | | | | | | | | | | | | | | | | | | | | | | | $2,020 |
| 2 | **Pressure range** | *500...1100 hPa* | *Class A / one sensor* | | | *1* | | | | | | | | | | | | | | | | | | | | | $200 |
| | | **500...1100 hPa** | **Class B / one sensor** | | | **2** | | | | | | | | | | | | | | | | | | | | | |
| | | *500...1100 hPa* | *Class A / two sensors* | | | *3* | | | | | | | | | | | | | | | | | | | | | $620 |
| | | *500...1100 hPa* | *Class B / two sensors* | | | *4* | | | | | | | | | | | | | | | | | | | | | $420 |
| | | **50...1100 hPa** | **One sensor, class B only** | | | **5** | | | | | | | | | | | | | | | | | | | | | |
| | | *50...1100 hPa* | *Two sensors, class B only* | | | *6* | | | | | | | | | | | | | | | | | | | | | $420 |
| 3 | **Temperature probe cable length** | **2m cable** | | | | | | | **H** | | | | | | | | | | | | | | | | | | |
| | | *5 m cable* | | | | | | | *J* | | | | | | | | | | | | | | | | | | $20 |
| | | *10 m cable* | | | | | | | *K* | | | | | | | | | | | | | | | | | | $60 |
| 4 | **Additional temperature probe** | **No probe** | | | | | | **0** | | | | | | | | | | | | | | | | | | | |
| 5 | **Display** | **No display** | | | | | | | **0** | | | | | | | | | | | | | | | | | | |
| | | *Graphic LCD with backlight* | | | | | | | *1* | | | | | | | | | | | | | | | | | | $320 |
| 6 | **Power supply** | **10...35 VDC, 24 VAC** | (HMT300PWS) | | | | | | | **A** | | | | | | | | | | | | | | | | | |
| | | *Galvanic isolation for outputs 10...35 VDC 24 VAC* | (DCDC-1) | | | | | | | *B* | | | | | | | | | | | | | | | | | $80 |
| | | *Universal AC power (100....240 VAC)* | (POWER-1) | | | | | | | *C* | | | | | | | | | | | | | | | | | $200 |
| | | *Universal AC power (100....240 VAC) + US power cord* | (POWER-1 AND 215991) | | | | | | | *D* | | | | | | | | | | | | | | | | | $210 |
| | | *External US AC-adapter (for LAN/WLAN interface in USA and Canada)* | Not IP65 | | | | | | | *K* | | | | | | | | | | | | | | | | | $60 |
| 7 | **Output signal** | **RS232C only, No Analog output** | Mandatory with two pressure sensors | | | | | | | | **0** | | | | | | | | | | | | | | | | |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **4...20 mA** | | | | | | | | *1* | | | | | | | | | | | | | | | | $190 |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **0... 20 mA** | | | | | | | | *2* | | | | | | | | | | | | | | | | $190 |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **0... 1 V** | | | | | | | | *3* | | | | | | | | | | | | | | | | $190 |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **0... 5 V** | | | | | | | | *4* | | | | | | | | | | | | | | | | $190 |
| | | ***RS232C** + Optional Analog output (Ch1, Ch2, Ch3)* | **0... 10 V** | | | | | | | | *5* | | | | | | | | | | | | | | | | $190 |
| | **Parameter and scaling for analog output (Ch1, Ch2, Ch3)** | **No Analog output** | | | | | | | | | | **A** | **A** | **A** | | | | | | | | | | | | | |
| | | **T** | **(range: see below)** | | | | | | | | | **C** | **C** | | | | | | | | | | | | | | |
| | | **P** | **(pressure range: selection in item 2)** | | | | | | | | | | | **P** | | | | | | | | | | | | | |
| 8 | **Special** | **Define scale for** | **Ch1:**_____ **Ch2:**_____ **Ch3:**_____ | | | | | | | | | **X** | **X** | **X** | | | | | | | | | | | | | |
| 9 | | | Channel 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | Channel 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Channel 3 only for pressure | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | **Analog output range for temperature** | **No analog output** | | | | | | | | | | | | | **A** | | | | | | | | | | | | |
| | | **-40...+60 °C** | **(-40...+140 °F)** | | | | | | | | | | | | **B** | | | | | | | | | | | | |
| | Note: Select option A, | **-20...+60 °C** | **(-4...+140 °F)** | | | | | | | | | | | | **F** | | | | | | | | | | | | |
| | if T output is not required | **0...+60 °C** | **(+32...+140 °F)** | | | | | | | | | | | | **K** | | | | | | | | | | | | |
| | | | **special range :** _____ | | | | | | | | | | | | **X** | | | | | | | | | | | | |
| 12 | **Output format for serial interface** | **Standard** | | | | | | | | | | | | | | **1** | | | | | | | | | | | |
| 13 | **Output units** | **Metric** | | | | | | | | | | | | | | | | **A** | | | | | | | | | |
| | | **Non-metric** | | | | | | | | | | | | | | | | **B** | | | | | | | | | |
| 14 | **Optional module** | **No module** | Mandatory with two pressure sensors or analog output | | | | | | | | | | | | | | | | **0** | | | | | | | | |
| | | *Relay output* | (RELAY-1) - Not possible with power supply module | | | | | | | | | | | | | | | | *1* | | | | | | | | $180 |
| | | *RS485 serial interface (galvanically isolated)* | (RS485-1) | | | | | | | | | | | | | | | | *2* | | | | | | | | $160 |
| | | *LAN (Ethernet) interface + 2 m cable (RJ45)* | | | | | | | | | | | | | | | | | *4* | | | | | | | | $260 |
| | | *WLAN (Wireless Ethernet) interface + antenna* | | | | | | | | | | | | | | | | | *5* | | | | | | | | $320 |
| | | *Data logger module* | | | | | | | | | | | | | | | | | *6* | | | | | | | | $350 |
| 15 | **Cable bushings** | **Cable gland (for 8...11 mm cable) (for 0.315...0.433 inch cable)** | (214728SP) | | | | | | | | | | | | | | | | | | | | | | | **A** | |
| | Note: The universal AC power | **Conduit fitting NPT1/2"** | (214780SP) | | | | | | | | | | | | | | | | | | | | | | | **B** | |
| | must not be connected | *8-pole connector with 5m cable* | (212142) | | | | | | | | | | | | | | | | | | | | | | | *C* | $60 |
| | through the 8-pole connector | *8-pole counter connector with screw terminals* | (212416) | | | | | | | | | | | | | | | | | | | | | | | *D* | $60 |
| | or D9 adapter | *D9-adapter* | *Only for RS232C, RS485 and DC supply* | | | | | | | | | | | | | | | | | | | | | | | *E* | $70 |
| 16 | **Pressure fitting** | **Barbed fitting for 1/8" hose** | (19498) | | | | | | | | | | | | | | | | | | | | | | | **1** | |
| | | *Quick connector with shutoff valve for 1/8" hose* | (19886, 25328 + 25329) | | | | | | | | | | | | | | | | | | | | | | | *2* | $40 |
| 17 | **Transmitter installation** | **Normal mounting** | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | *Wall mounting plate* | (214829) | | | | | | | | | | | | | | | | | | | | | | *B* | | $90 |
| | | *Pole installation kit* | (215108) | | | | | | | | | | | | | | | | | | | | | | *C* | | $100 |
| | | *Pole installation kit with Rain Shield* | (215109) | | | | | | | | | | | | | | | | | | | | | | *D* | | $110 |
| | | *DIN rail kit* | (215094) | | | | | | | | | | | | | | | | | | | | | | *E* | | $90 |
| 18 | **Humidity sensor** | **No humidity sensor** | | | | | | | | | | | | | | | | | | | | **0** | | | | | |
| 19 | **Sensor protection** | **No sensor protection** | | | | | | | | | | | | | | | | | | | | | **A** | | | | |
| 20 | **Probe installation accessories** | **No probe installation accessories** | | | | | | | | | | | | | | | | | | | | | | **0** | | | |
| 21 | **User's Guide language** | **No manual** | | | | | | | | | | | | | | | | | | | | | | | **A** | | |
| | | **English** | | | | | | | | | | | | | | | | | | | | | | | **B** | | |
| 22 | **PC Accessories** | **No** | | | | | | | | | | | | | | | | | | | | | | | **0** | | |
| | | *Service cable for PC* | (19446ZZ) | | | | | | | | | | | | | | | | | | | | | | *1* | | $40 |
| | | *MI70LINK software for Windows® with RS232 service cable* | (215005) | | | | | | | | | | | | | | | | | | | | | | *2* | | $60 |
| | | *Service cable for PC, USB software driver* | (219685) | | | | | | | | | | | | | | | | | | | | | | *3* | | $90 |
| | | *MI70LINK software for Windows® with USB service cable* | (219916) | | | | | | | | | | | | | | | | | | | | | | *4* | | $90 |
| 23 | **Calibration Certificate** | **ISO9001 compliant factory calibration / No Calibration Contract** | | | | | | | | | | | | | | | | | | | | | | | **A** | | |

**Selections in bold are included in the prices of the basic versions** TOTAL

*Selections in italic are available at an extra price.* QTY

Shaded sections indicate typical selections. TOTAL VALUE

**Example of order code with typical settings**

| PTU300 | T | 1 | H | 0 | 0 | A | 1 | A | C | P | B | 1 | B | 0 | A | 1 | A | 0 | A | 0 | B | 0 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|



## Vaisala BAROCAP® Digital Barometer PTB330 - One Sensor

| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | PRICE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Digital Barometer with One Pressure Sensor** | | **PTB330** | | | | | | | **A** | | | | | | | | |
| 1 | **Accuracy Class** | *Class A* | | | | | | | | | | | | | | | | $1,790 |
| | | *Class B* | | | | | | | | | | | | | | | | $1,580 |
| 2 | **Display** | **No display** | | | | **0** | | | | | | | | | | | | |
| | | *Graphical LCD with backlight* | | | | *1* | | | | | | | | | | | | $320 |
| 3 | **Power Supply** | **10...35 VDC** | | | | | | | | **A** | | | | | | | | |
| | | 10...35 VDC with external power on/off triggering | | | | | | | | B | | | | | | | | |
| | | *10...35 VDC, 24 VAC, galvanical isolation for outputs* | (DCDC-1) | | | | | | | *C* | | | | | | | | $80 |
| | | *Internal AC-power (110....240 VAC)* | (POWER-1) | | | | | | | *D* | | | | | | | | $200 |
| | | *Internal AC-power (110....240 VAC) + US power cord* | (216017) | | | | | | | *F* | | | | | | | | $210 |
| | | *External US AC-adapter (Not IP65)* | (MI70USADAPTER) | | | | | | | *K* | | | | | | | | $60 |
| 4 | **Signal Output** | **RS-232 only, no analog output** | | | | | | | | | **A** | | | | | | | |
| | | *Analog output* | *4...20 mA* | | | | | | | | *C* | | | | | | | $160 |
| | | | *0...20 mA* | | | | | | | | *D* | | | | | | | $160 |
| | | | *0...1 V* | | | | | | | | *E* | | | | | | | $160 |
| | | | *0...5 V* | | | | | | | | *F* | | | | | | | $160 |
| | | | *0...10 V* | | | | | | | | *G* | | | | | | | $160 |
| | | *RS-485* | (RS485-1) | | | | | | | | *K* | | | | | | | $160 |
| 5 | **Pressure range** | **500...1100 hPa** | | | | | | | | | | **H** | | | | | | |
| | | **50...1100 hPa** | Class B only | | | | | | | | | **J** | | | | | | |
| 6 | **Optional Module (slot 3)** | **No module** | | | | | | | | | | | **A** | | | | | |
| | | *Relay module (Select **A** with internal AC power)* | (RELAY-1) | | | | | | | | | | *B* | | | | | $180 |
| 7 | **Optional Module (slot 4)** | **No module** | | | | | | | | | | | | **A** | | | | |
| 8 | **Customer Connection** | **Cable bushing for 10...14 mm cable** | | | | | | | | | | | | | **C** | | | |
| | | **Conduit fitting NPT 1/2"** | | | | | | | | | | | | | **D** | | | |
| | | *8-pole M12 connector with 5 m cable* | (212142) | | | | | | | | | | | | *E* | | | $60 |
| | | *8-pole M12 connector with screw terminals* | (212416) | | | | | | | | | | | | *F* | | | $60 |
| | | *D9 connector* | Not IP65 | | | | | | | | | | | | *P* | | | $70 |
| 9 | **Pressure Fitting** | **Barbed fitting 1/8"** | | | | | | | | | | | | | | **E** | | |
| | | *Quick connector 1/8"* | (19886, 25328 + 25329) | | | | | | | | | | | | | *L* | | $40 |
| 10 | **Optional Connection** | **None** | Select **A** only with external AC adapter | | | | | | | | | | | | | | **A** | |
| | | **Plugged** | | | | | | | | | | | | | | | **B** | |
| | | Cable bushing for 10...14 mm cable | Select **C** or **D** with internal AC power | | | | | | | | | | | | | | C | |
| | | Conduit fitting NPT 1/2" | Select **C** or **D** with internal AC power | | | | | | | | | | | | | | D | |
| 11 | **Installation** | **Normal mounting** | | | | | | | | | | | | | | | | |
| | | *Adapter plate (for replacing PTB220)* | (214829) | | | | | | | | | | | | | | | $90 |
| | | *Pole installation kit* | (215108) | | | | | | | | | | | | | | | $100 |
| | | *Pole installation kit with Rain Shield* | (215109) | | | | | | | | | | | | | | | $110 |
| | | *DIN rail kit* | (215094) | | | | | | | | | | | | | | | $90 |
| 12 | **Calibration** | **ISO 9001 compliant factory calibration / No calibration contract** | | | | | | | | | | | | | | | | |
| | | *ISO/IEC 17025 Accredited calibration* | (Separate order form required) | | | | | | | | | | | | | | | Order Guide |
| 13 | **Service contract** | **No Service Contract** | | | | | | | | | | | | | | | | |
| 14 | **User's Guide language** | **No User's Guide** | | | | | | | | | | | | | | | | |
| | | **English** | | | | | | | | | | | | | | | | |

TOTAL VALUE

QTY

TOTAL VALUE

**Items in bold are included in the basic price.**

*Selections in italic are available at an additional cost.*

Shaded sections indicate typical selections.

Example of order code with typical settings:

| PTB330 - One Sensor | A | 0 | A | A | H | A | A | C | E | B | 0 | A | 0 | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Accessories to be ordered separately.**

| Description: | Order Code: | PRICE |
|---|---|---|
| **Interface cables** | | |
| Serial Interface Cable | 19446ZZ | $40 |
| Software Interface Kit (MI70LINK + serial interface cable) | 215005 | $60 |
| USB-RJ45 Serial Connection Cable | 219685 | $90 |
| MI70LINK software for Windows® + USB-RJ45 Serial Connection Cable | 219916 | $90 |

# Vaisala BAROCAP® Digital Barometer PTB330 - Two Sensors

| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Digital Barometer with Two Pressure Sensors, Single Redundancy** | | **PTB330** | | | | | | | **A** | | | | | | | | **PRICE** |
| 1 | **Accuracy Class** | *Class A* | | | | | | | | | | | | | | | | $2,250 |
| | | *Class B* | | | | | | | | | | | | | | | | $2,040 |
| 2 | **Display** | **No display** | | **0** | | | | | | | | | | | | | | |
| | | *Graphical LCD with backlight* | | *1* | | | | | | | | | | | | | | $320 |
| 3 | **Power Supply** | **10...35 VDC** | | | | **A** | | | | | | | | | | | | |
| | | 10...35 VDC with external power on/off triggering | | | | B | | | | | | | | | | | | |
| | | *10...35 VDC, 24 VAC, galvanical isolation for outputs* | (DCDC-1) | | | *C* | | | | | | | | | | | | $80 |
| | | *External US AC-adapter (Not IP65)* | (MI70USADAPTER) | | | *K* | | | | | | | | | | | | $60 |
| 4 | **Signal Output** | **RS-232 only, no analog output** | | | | | **A** | | | | | | | | | | | |
| | | *Analog output* 4...20 mA | | | | | *C* | | | | | | | | | | | $160 |
| | | 0...20 mA | | | | | *D* | | | | | | | | | | | $160 |
| | | 0...1 V | | | | | *E* | | | | | | | | | | | $160 |
| | | 0...5 V | | | | | *F* | | | | | | | | | | | $160 |
| | | 0...10 V | | | | | *G* | | | | | | | | | | | $160 |
| | | *RS-485* | (RS485-1) | | | | *K* | | | | | | | | | | | $160 |
| 5-6 | **Pressure Range** | **500...1100 hPa** | | | | | | **H** | **H** | | | | | | | | | |
| | (Same range for both sensors) | **50...1100 hPa** | Class B only | | | | | **J** | **J** | | | | | | | | | |
| 7 | **Optional Module (slot 4)** | **No module** | | | | | | | | **A** | | | | | | | | |
| 8 | **Customer Connection** | **Cable bushing for 10...14 mm cable** | | | | | | | | | **C** | | | | | | | |
| | | **Conduit fitting NPT 1/2"** | | | | | | | | | **D** | | | | | | | |
| | | *8-pole M12 connector with 5 m cable* | (212142) | | | | | | | | *E* | | | | | | | $60 |
| | | *8-pole M12 connector with screw terminals* | (212416) | | | | | | | | *F* | | | | | | | $60 |
| | | *D9 connector* | Not IP65 | | | | | | | | *P* | | | | | | | $70 |
| 9 | **Pressure Fitting** | **Barbed fitting 1/8", differential measurement** | Select **E** for optional connection (10) | | | | | | | | | **E** | | | | | | |
| | | **Barbed fitting 1/8"** | | | | | | | | | | **F** | | | | | | |
| | | *Quick connector 1/8", differential measurement* | Select **L** for optional connection (10) (19886, 25328 + 25329) | | | | | | | | | *L* | | | | | | $40 |
| | | *Quick connector 1/8"* | (19886, 25328 + 25329) | | | | | | | | | *M* | | | | | | $40 |
| 10 | **Optional Connection** | **None** | Select **A** only with external AC adapter | | | | | | | | | | **A** | | | | | |
| | | **Plugged** | | | | | | | | | | | **B** | | | | | |
| | | Cable bushing for 10...14 mm cable | | | | | | | | | | | C | | | | | |
| | | Conduit fitting NPT 1/2" | | | | | | | | | | | D | | | | | |
| | | Barbed fitting 1/8", for differential measurement | Not available with AC-adapter | | | | | | | | | | E | | | | | |
| | | *Quick connector 1/8", for differential measurement* | Not available with AC-adapter (19886, 25328 + 25329) | | | | | | | | | | *L* | | | | | $40 |
| 11 | **Installation** | **Normal mounting** | | | | | | | | | | | | **0** | | | | |
| | | *Adapter plate (for replacing PTB220)* | (214829) | | | | | | | | | | | *1* | | | | $90 |
| | | *Pole installation kit* | (215108) | | | | | | | | | | | *2* | | | | $100 |
| | | *Pole installation kit with Rain Shield* | (215109) | | | | | | | | | | | *3* | | | | $110 |
| | | *DIN rail kit* | (215094) | | | | | | | | | | | *4* | | | | $90 |
| 12 | **Calibration** | **ISO 9001 compliant factory calibration / No calibration contract** | | | | | | | | | | | | | **A** | | | |
| | | *ISO/IEC 17025 Accredited calibration* | (Separate order form required) | | | | | | | | | | | | *B* | | | Order Guide |
| 13 | **Service contract** | **No Service Contract** | | | | | | | | | | | | | | **0** | | |
| 14 | **User's Guide language** | **No User's Guide** | | | | | | | | | | | | | | | **A** | |
| | | **English** | | | | | | | | | | | | | | | **B** | |
| | | | | | | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | | | | | TOTAL VALUE | |

**Items in bold are included in the basic price.**
*Selections in italic are available at an additional cost.*
Shaded sections indicate typical selections.

Example of order code with typical settings:

| PTB330 - Two Sensors | A | 0 | A | A | H | H | A | C | F | B | 0 | A | 0 | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Accessories to be ordered separately** **Definition:**

| Interface cables | Order Code: | PRICE |
|---|---|---|
| Serial Interface Cable | 19446ZZ | $40 |
| Software Interface Kit (MI70LINK + serial interface cable) | 215005 | $60 |
| USB-RJ45 Serial Connection Cable | 219685 | $90 |
| MI70LINK software for Windows® + USB-RJ45 Serial Connection Cable | 219916 | $90 |



# Vaisala BAROCAP® Digital Barometer PTB330 - Three sensors

| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Digital Barometer with Three Pressure Sensors, Double Redundancy** | | **PTB330 - 3 Sensors** | | | | | | | | | | | | | | | **PRICE** |
| 1 | **Accuracy Class** | *Class A* | | | | | | | | | | | | | | | | $2,710 |
| | | **Class B** | | | | | | | | | | | | | | | | $2,500 |
| 2 | **Display** | **No display** | | **0** | | | | | | | | | | | | | | |
| | | *Graphical LCD with backlight* | | *1* | | | | | | | | | | | | | | $320 |
| 3 | **Power Supply** | **10...35 VDC** | | | | **A** | | | | | | | | | | | | |
| | | 10...35 VDC with external power on/off triggering | | | | B | | | | | | | | | | | | |
| | | *10...35 VDC, 24 VAC, galvanical isolation for outputs* | (DCDC-1) | | | *C* | | | | | | | | | | | | $80 |
| | | *External US AC-adapter (Not IP65)* | (MI70USADAPTER) | | | *K* | | | | | | | | | | | | $60 |
| 4 | **Signal Output** | **RS-232 only, no analog output** | | | | | **A** | | | | | | | | | | | |
| | | *Analog output* 4...20 mA | | | | | *C* | | | | | | | | | | | $160 |
| | | 0...20 mA | | | | | *D* | | | | | | | | | | | $160 |
| | | 0...1 V | | | | | *E* | | | | | | | | | | | $160 |
| | | 0...5 V | | | | | *F* | | | | | | | | | | | $160 |
| | | 0...10 V | | | | | *G* | | | | | | | | | | | $160 |
| | | *RS-485* | (RS485-1) | | | | *K* | | | | | | | | | | | $160 |
| 5-7 | **Pressure Range** | **500...1100 hPa** | | | | | | **H** | **H** | **H** | | | | | | | | |
| | (Same range for all sensors) | **50...1100 hPa** | Class B only | | | | | **J** | **J** | **J** | | | | | | | | |
| 8 | **Customer Connection** | **Cable bushing for 10...14 mm cable** | | | | | | | | | **C** | | | | | | | |
| | | **Conduit fitting NPT 1/2"** | | | | | | | | | **D** | | | | | | | |
| | | *8-pole M12 connector with 5 m cable* | (212142) | | | | | | | | *E* | | | | | | | $60 |
| | | *8-pole M12 connector with screw terminals* | (212416) | | | | | | | | *F* | | | | | | | $60 |
| | | *D9 connector* | Not IP65 | | | | | | | | *P* | | | | | | | $70 |
| 9 | **Pressure Fitting** | **Barbed fitting 1/8"** | | | | | | | | | | **G** | | | | | | |
| | | *Quick connector 1/8"* | (19886, 25328 + 25329) | | | | | | | | | *N* | | | | | | $40 |
| 10 | **Optional Connection** | **None** | Select **A** only with external AC adapter | | | | | | | | | | **A** | | | | | |
| | | **Plugged** | | | | | | | | | | | **B** | | | | | |
| | | Cable bushing for 10...14 mm cable | | | | | | | | | | | C | | | | | |
| | | Conduit fitting NPT 1/2" | | | | | | | | | | | D | | | | | |
| 11 | **Installation** | **Normal mounting** | | | | | | | | | | | | **0** | | | | |
| | | *Adapter plate (for replacing PTB220)* | (214829) | | | | | | | | | | | *1* | | | | $90 |
| | | *Pole installation kit* | (215108) | | | | | | | | | | | *2* | | | | $100 |
| | | *Pole installation kit with Rain Shield* | (215109) | | | | | | | | | | | *3* | | | | $110 |
| | | *DIN rail kit* | (215094) | | | | | | | | | | | *4* | | | | $90 |
| 12 | **Calibration** | **ISO 9001 compliant factory calibration / No calibration contract** | | | | | | | | | | | | | **A** | | | |
| | | *ISO/IEC 17025 Accredited calibration* | (Separate order form required) | | | | | | | | | | | | *B* | | | Order Guide |
| 13 | **Service contract** | **No Service Contract** | | | | | | | | | | | | | | **0** | | |
| 14 | **User's Guide language** | **No User's Guide** | | | | | | | | | | | | | | | **A** | |
| | | **English** | | | | | | | | | | | | | | | **B** | |
| | | | | | | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | | | | | | TOTAL VALUE | |

**Items in bold are included in the basic price.**
*Selections in italic are available at an additional cost.*
Shaded sections indicate typical selections.

Example of order code with typical settings:

| PTB330 - Three Sensors | A | 0 | A | A | H | H | H | C | G | B | 0 | A | 0 | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Accessories to be ordered separately.** **Definitions:** **Order Code:** **PRICE**

| Interface cables | | |
|---|---|---|
| Serial Interface Cable | 19446ZZ | $40 |
| Software Interface Kit (MI70LINK + serial interface cable) | 215005 | $60 |
| USB-RJ45 Serial Connection Cable | 219685 | $90 |
| MI70LINK software for Windows® + USB-RJ45 Serial Connection Cable | 219916 | $90 |

VAISALA www.vaisala.com

# GMW116 Carbon Dioxide and Temperature Transmitter for Ventilation Control

*The Vaisala CARBOCAP® Carbon Dioxide and Temperature Transmitter GMW116.*

## Features/Benefits

- Compact dual-parameter transmitter: measures both $CO_2$ and T
- Incorporates Vaisala CARBOCAP®, the silicon based NDIR sensor with unique internal referencing
- Advanced, single-beam, dual wavelength measurement with no moving parts
- Excellent long-term stability
- Ideal for ventilation control in all types of occupied spaces including those with around-the-clock occupancy
- No need for temperature compensation

The Vaisala CARBOCAP® Carbon Dioxide and Temperature Transmitter GMW116 is the compact-size transmitter that measures both carbon dioxide and temperature. The sensor is accurate and durable and it has an excellent long-term stability, which decreases maintenance.

The excellent performance of the Vaisala CARBOCAP® sensors results largely from the stable reference provided by the electrically tunable Fabry-Perot Interferometer (FPI).

In buildings with around-the-clock occupancy (e.g. hospitals, work-places, residential buildings, retirement homes), the assumed background $CO_2$ level reference is simply not applicable. The true internal reference measurement of Vaisala CARBOCAP® $CO_2$ transmitters provides years of stable $CO_2$ measurements.

The GMW116 Transmitter is designed especially for demand controlled ventilation applications with $CO_2$ measurement range of 0 … 2000 ppm and temperature range of 0 ... +50 °C.

With GMW116 there is no need for temperature compensation. The ideal gas temperature behaviour is taken into account automatically.

# Technical data

## Performance

| | |
|---|---|
| $CO_2$-measurement range | 0 ... 2000 ppm |
| Temperature measurement range | 0 ... +50 °C |
| Accuracy (including repeatability, non-linearity and calibration uncertainty) | ± (2 % of range + 2 % of reading |
| Long-term stability | ± 5 % of range/5 years |
| Response time T90 | 1 min |
| Temperature dependence | compensated |
| Pressure dependence, typical | +0.15 % of reading/hPa |
| Temperature measurement accuracy | ± 0.7 °C at 25 ° |
| Warm-up time | 1 min, 10 min for full. specification |
| Product lifetime | > 10 years |

## Operating environment

| | |
|---|---|
| Temperature | 0 ... +50 °C |
| Humidity | 0 ... 85 % RH |
| Pressure | 700 ... 1200 hPa |
| Electromagnectic compatibility | |
| Complies with EMS standard EN61326-1, Generic Environment | |

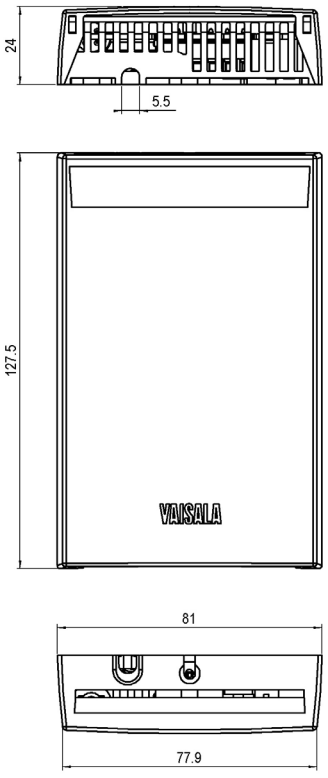
## Inputs and outputs

| | |
|---|---|
| Operating voltage | 24 V (±20 %) AC/DC |
| Power consumption | <2 W |
| Outputs | 0 … 10 V |

## Housing

| | |
|---|---|
| Material | ABS/PC blend plastics |
| Weight | 120 g |
| Cover and base colour | white RAL 9003 |
| Fire resistance | UL94 V0 |
| Ingress protection | IP30 |

## Dimensions

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For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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CE

## PTB210 Series Digital Barometers

### Analog Output

| | | | | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|---|---|---|
| | **Vaisala BAROCAP® Barometric Pressure Transmitter - Analog Output** | **PTB210** | **C** | | | | | **PRICE** |
| 1 | Pressure range | **500…1100 hPa** | **3** | | | | | $1,020 |
| | | **800…1060 hPa** | **4** | | | | | $1,020 |
| | | **600…1060 hPa** | **5** | | | | | $1,020 |
| | | **900…1100 hPa** | **6** | | | | | $1,020 |
| 2 | Output options | **0…5 VDC** | **C** | | | | | |
| | | **0…2.5 VDC** | **D** | | | | | |
| 3 | Cable length | **1.0 m** | | | | **1** | | |
| | | *2.0 m* | | | | *2* | | $15 |
| | | *3.0 m* | | | | *3* | | $20 |
| | | *5.0 m* | | | | *4* | | $40 |
| | | *10.0 m* | | | | *5* | | $80 |
| 4 | Manual language | **no manual** | | | | | **A** | |
| | | **English** | | | | | **M** | |
| | | | | | | | TOTAL | |
| | | | | | | | QTY | |
| | | | | | | | TOTAL VALUE | |

**Items in bold are included in the basic price.**

*Selections in italic are available at an additional cost.*

Shaded sections indicate typical selections.

Example of an order code with typical settings:

| PTB210 | C | 3 | C | 1 | M |
|---|---|---|---|---|---|

| **Accessories and Spare Parts:** | **Description:** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Static Pressure head | SPH10 | $270 |
| | Static Pressure head, heated | SPH20 | $820 |



## PTB210 Series Digital Barometers

### Serial Output

| | | | | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala BAROCAP® Barometric Pressure Transmitter** | | **PTB210** | | | | | | **PRICE** |
| 1 | Accuracy class | **Class A** | **(only for 500…1100 hPa range)** | **A** | | | | | $1,470 |
| | | **Class B** | | **B** | | | | | $1,230 |
| 2 | Pressure range | **500…1100 hPa** | *(Class A or B)* | | **1** | | | | |
| | | **50…1100 hPa** | *(Class B only)* | | **2** | | | | |
| 3 | Output options | **Only RS 232C serial communication** | | | | **A** | | | |
| | | *RS 485 (and RS 232C) serial communication (** | | | | *B* | | | $160 |
| | | *TTL level (and RS 232C) serial communication (** | | | | *T* | | | $160 |
| 4 | Cable length | **1.0 m** | | | | | **1** | | |
| | | *2.0 m* | | | | | *2* | | $15 |
| | | *3.0 m* | | | | | *3* | | $20 |
| | | *5.0 m* | | | | | *4* | | $40 |
| | | *10.0 m* | | | | | *5* | | $80 |
| 5 | Manual language | **no manual** | | | | | | **A** | |
| | | **English** | | | | | | **B** | |
| | | | | | | | | TOTAL | |
| | | | | | | | | QTY | |
| | | | | | | | | TOTAL VALUE | |

(* The two output protocols cannot be used simultaneously.

**Items in bold are included in the basic price.**

*Selections in italic are available at an additional cost.*

Shaded sections indicate typical selections.

Example of an order code with typical settings:

| PTB210 | B | 1 | A | 1 | B |
|---|---|---|---|---|---|

| **Accessories and Spare Parts:** | **Description:** | **Order Code:** | **PRICE** |
|---|---|---|---|
| | Static Pressure head | SPH10 | $270 |
| | Static Pressure head, heated | SPH20 | $820 |

# PTB110 Barometer

| | | | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|---|---|
| | **Barometer** | **PTB110** | | | | | | $950 |
| 1 | Pressure range | **500…1100 hPa** | **1** | | | | | |
| | | **600...1100 hPa** | **2** | | | | | |
| | | **800...1100 hPa** | **3** | | | | | |
| | | **600...1060 hPa** | **4** | | | | | |
| | | **800…1060 hPa** | **5** | | | | | |
| 2 | Output options | **0...5 Vdc** | | **A** | | | | |
| | | **0...2.5 Vdc** | | **B** | | | | |
| | | **Frequency output** | | **F** | | | | |
| 3 | Installation | **Standard installation** | | | **0** | | | |
| | | *DIN rail installation kit* | | | *1* | | | $10 |
| 4 | Pressure fitting | **Standard** | | | | **A** | | |
| | | *Quick connector with shut-off valve for 1/8" hose* | | | | *B* | | $40 |
| 5 | User's guide | **No user's guide** | | | | | **A** | |
| | | **English** | | | | | **B** | |
| | | | | | | | TOTAL | |
| | | | | | | | QTY | |
| | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| PTB110 | 1 | A | 0 | A | B |
|---|---|---|---|---|---|



# PTB330TS Barometric Pressure Transfer Standard

| | Price |
|---|---|
| **Vaisala BAROCAP® Barometric Pressure Transfer Standard PTB330TS** | $3,200 |

Please, select below a configuration code for the PTB330 Barometer on the first row, for the MI70 Indicator on the second row and optionally for the HMP155 Probe on the third row.

## PTB330 Digital Barometer for PTB330TS

| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala BAROCAP® Digital Barometer** | **PTB330** | **A** | **0** | **A** | **A** | **H** | | | **F** | | **B** | **5** | | **0** | **1** | Price |
| 1 | **Accuracy Class** | **Class A** | **A** | | | | | | | | | | | | | | |
| 2 | **Display** | **No display** | | **0** | | | | | | | | | | | | | |
| 3 | **Power Supply** | **10...35 VDC** | | | **A** | | | | | | | | | | | | |
| 4 | **Signal Output** | **RS-232 only, no analog output** | | | | **A** | | | | | | | | | | | |
| 5 | **Pressure Range** | **Barometer module 500...1100 hPa** | | | | | **H** | | | | | | | | | | |
| 6 | **2nd Barometer module** | **No module** | | | | | | **A** | | | | | | | | | |
| | | *Barometer module 500...1100 hPa* | | | | | | *H* | | | | | | | | | $460 |
| 7 | **3rd Barometer module** | **No module** | | | | | | | **A** | | | | | | | | |
| | | *Barometer module 500...1100 hPa* | | | | | | | *H* | | | | | | | | $460 |
| 8 | **Customer Connection** | **8-pole M12 connector** | | | | | | | | **F** | | | | | | | |
| 9 | **Pressure Fitting** | **Barbed fitting 1/8", one barometer module** Choose according | | | | | | | | | **E** | | | | | | |
| | | **Barbed fitting 1/8", two barometer modules** to selection | | | | | | | | | **F** | | | | | | |
| | | **Barbed fitting 1/8", three barometer modules** made above | | | | | | | | | **G** | | | | | | |
| 10 | **Optional Connection** | **Plugged** | | | | | | | | | | **B** | | | | | |
| 11 | **Installation** | **PTB330TS in weatherproof hard case** | | | | | | | | | | | **5** | | | | |
| 12 | **Calibration** | **ISO 9001 compliant factory calibration / No calibration contract** | | | | | | | | | | | | **A** | | | |
| | | *Special calibration for PTB330TS* See separate order form | | | | | | | | | | | | *X* | | | |
| 13 | **Service contract** | **No Service Contract** | | | | | | | | | | | | | **0** | | |
| 14 | **User's Guide language** | **PTB330TS Guide in English** | | | | | | | | | | | | | | **1** | |

**Selections in bold are included in the price of the basic version**
*Selections in italic are available at an extra cost*

Example of order code with typical settings:

| PTB330 | A | 0 | A | A | H | *H* | *H* | F | G | B | 5 | A | 0 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## MI70 Hand-Held Indicator for PTB330TS

| | | | 1 | 2 | 3 | |
|---|---|---|---|---|---|---|
| | **Vaisala Hand-held Indicator** | **MI70** | | **4** | | Price |
| 1 | **Charger type** | **Euro AC-adapter** | **B** | | | |
| | | **US AC-adapter** | **D** | | | |
| 2 | **Installation** | **PTB330TS** | | **4** | | |
| 3 | **Accessories** | **none** | | | **0** | |
| | | *MI70LINK software with RS232 cable* | | | *1* | $60 |
| | | *MI70LINK software with USB cable* | | | *4* | $90 |
| | | | | | **Total value** | |

**Selections in bold are included in the price of the basic version**
*Selections in italic are available at an extra cost*

Example of order code with typical settings:

| MI70 | D | 4 | *4* |
|---|---|---|---|

**Spare parts:**

| | | |
|---|---|---|
| MI70 connection cable to HMT330, MMT330, DMT340, HMT100, PTB330 | Item: 211339 | $60 |
| MI70 battery | Item: 26755 | $30 |

## OPTIONAL (with additional price):

## HMP155 Humidity and Temperature Probe for PTB330TS

| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala HUMICAP® Humidity and Temperature Probe** | **HMP155** | **E** | **1** | **A** | **A** | | | **A** | | **A** | **0** | | **1** | *C* | **4** | **A** | **$640** |
| 1 | **Probe type** | **RS485 serial output** | **E** | | | | | | | | | | | | | | | |
| 2 | **Signal output selection** | **RS485 serial output** | | **1** | | | | | | | | | | | | | | |
| 3 | **Analog output signal for CH1** | **None** | | | **A** | | | | | | | | | | | | | |
| 4 | **Analog output signal for CH2** | **None** | | | | **A** | | | | | | | | | | | | |
| 5 | **Units** | **Metric** | | | | | **1** | | | | | | | | | | | |
| | | **Non-metric** | | | | | **2** | | | | | | | | | | | |
| 6 | **Humidity sensor type** | **General purpose HUMICAP180R** | | | | | | **1** | | | | | | | | | | |
| | | *Composite sensor HUMICAP180RC* | | | | | | *2* | | | | | | | | | | $60 |
| 7 | **Heating options** | **None** | | | | | | | **A** | | | | | | | | | |
| 8 | **Chemical purge** | **None** | | | | | | | | **0** | | | | | | | | |
| | | **Manual purge with MI70 (only with composite sensor)** | | | | | | | | **4** | | | | | | | | |
| 9 | **Sensor protection** | **Sintered Teflon filter** | | | | | | | | | **A** | | | | | | | |
| 10 | **Probe cable length** | **No cable (no counter connector)** | | | | | | | | | | **0** | | | | | | |
| 11 | **Additional Temperature probe** | **None (if probe type D selected, please select option A)** | | | | | | | | | | | **A** | | | | | |
| | | *Additional T-probe with 2m cable* | | | | | | | | | | | *B* | | | | | $160 |
| 12 | **Calibration** | **At room temperature** | | | | | | | | | | | | **1** | | | | |
| 13 | **PC-Accessories** | *MI70 connection cable Item:221801* | | | | | | | | | | | | | *C* | | | $60 |
| 14 | **Installation** | **PTB330TS** | | | | | | | | | | | | | | **4** | | |
| 15 | **(For production use only)** | | | | | | | | | | | | | | | | **A** | |
| | | | | | | | | | | | | | | | | | Total value | |

**Selections in bold are included in the price of the basic version**
*Selections in italic are available at an extra cost*

Example of order code with typical settings:

| HMP155 | E | 1 | A | A | 2 | 1 | A | 0 | A | 0 | A | 1 | *C* | 4 | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## WMT52 Ultrasonic Wind Speed and Direction Sensor

| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Vaisala WINDCAP® Ultrasonic Wind Sensor** | **WMT52** | | | | | | | | | | | **PRICE** |
| 1 | Measurement parameters | **Wind speed and direction** | **A** | | | | | | | | | | $1,080 |
| 2 | Communication interface | **SDI-12 v 1.3, 1200 baud, 7,E,1** | | **A** | **A** | | | | | | | | |
| 3 | | **RS-232, Standard ASCII auto, 19200 baud,8,N,1** | | **A** | **B** | | | | | | | | |
| | | **RS-485, Standard ASCII polled, 19200 baud, 8,N,1** | | **A** | **C** | | | | | | | | |
| | | **RS-422, Standard ASCII auto, 19200 baud, 8,N,1** | | **A** | **D** | | | | | | | | |
| | | **RS-422 NMEA 0183 v3.0, 4800 baud, 8,N,1** | | **A** | **E** | | | | | | | | |
| | | *USB/RS-232, 1.4 m USB cable, ASCII auto, 19200 baud,8,N,1 (220782)* | | *A* | *F* | | | | | | | | $110 |
| | | *USB/RS-485, 1.4 m USB cable, ASCII polled, 19200 baud, 8,N,1 (220782)* | | *A* | *G* | | | | | | | | $110 |
| 4 | Enhancements | **None** | | | | **0** | | | | | | | |
| | | *Heating* | | | | *1* | | | | | | | $90 |
| 5 | Connector | **No connector, bushing & grounding accessories** | | | | | **A** | | | | | | |
| | | *8-pin M12 male connector and bushing & grounding accessories* | | | | | *B* | | | | | | $55 |
| 6 | Cable | **No Cable** | | | | | | **A** | | | | | |
| | | *Shielded 2 meters long 8-pin M12 cable (222287)* | | | | | | *B* | | | | | $100 |
| | | *Shielded 10 meters long 8-pin M12 cable (222288)* | | | | | | *C* | | | | | $160 |
| | | *Shielded 40 meters long 14-pin cable, open end wires (217020)* | | | | | | *D* | | | | | $300 |
| | | *Shielded 10 meters long 8-pin M12 cable, connectors on both ends (215952)* | | | | | | *E* | | | | | $210 |
| 7 | Installation accessories | **None** | | | | | | | **0** | | | | |
| | | *Mounting kit improves classification from IP65 to IP66 (212792)* | | | | | | | *1* | | | | $90 |
| | | *Bird spike (212793)* | | | | | | | *2* | | | | $120 |
| | | *Mounting kit and Bird spike improves classification from IP65 to IP66 (212792 + 212793)* | | | | | | | *3* | | | | $200 |
| 8 | Supporting software | **None** | | | | | | | | **0** | | | |
| | | *Service Pack 2: Vaisala Configuration Tool for Windows, USB Service cable* | | | | | | | | *1* | | | $150 |
| 9 | Manual | **No manual** | | | | | | | | | **A** | | |
| | | **English** | | | | | | | | | **B** | | |
| 10 | Packing | **Standard** | | | | | | | | | | **0** | |
| | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| WMT52 | A | A | A | 0 | A | A | 1 | 1 | B | 0 |
|---|---|---|---|---|---|---|---|---|---|---|

**WXT52 Spare parts & Accessories**

| | | |
|---|---|---|
| 220614 | Service Pack 2: Vaisala Configuration Tool for Windows, USB Service cable | $180 |
| WMTBOTTOMSP | WMT52 Bottom assembly (with BIF card, M12 connector, short screws. O-rings) | $200 |

**WMT50/52 Spare parts & Accessories**

| | | |
|---|---|---|
| 220782 | USB RS-232/485, 1.4 meters USB / M12 cable | $140 |
| 222287 | Shielded 2 meters long 8-pin M12 cable | $140 |
| 222288 | Shielded 10meters long 8-pin M12 cable | $210 |
| 217020 | Shielded 40 meters long 14-pin cable, open end wires | $400 |
| 215952 | 10 meters long 8-pin M12 cable, connectors on both ends | $270 |
| 222109 | Bushing & grounding accessory kit | $30 |
| 212792 | Mounting kit (improves classification from IP65 to IP66) | $120 |
| WSP150 | Surge protector, no connectors | $300 |
| WSP152 | Surge protector for host PC (e.g. USB connection) inc. M12 connectors. Suitable with 220782 and 215952. | $350 |
| 212793 | Bird kit | $140 |

**WMT50 Spare parts & Accessories**

| | | |
|---|---|---|
| 215194 | Service Pack 1: Vaisala Configuration Tool, Weather Measurements (software and RS-232 WXT510 service cable) | $90 |
| 221523 | M8 adapter to WXT510 Service connector (use with Service pack 2) | $60 |



## WXT520 Weather Transmitter

| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Weather Transmitter** | **WXT520** | | | | | | | | | | 0 | **Price** |
| 1 | Measurement parameters | **Wsd+RH+T+P+R** | **A** | | | | | | | | | | $2,150 |
| 2 | Communication interface | **SDI-12 v 1.3, 1200 baud, 7,E,1** | | **A** | **A** | | | | | | | | |
| 3 | | **RS-232, Standard ASCII auto, 19200 baud,8,N,1** | | **A** | **B** | | | | | | | | |
| | | **RS-485, Standard ASCII polled, 19200 baud, 8,N,1** | | **A** | **C** | | | | | | | | |
| | | **RS-422, Standard ASCII auto, 19200 baud, 8,N,1** | | **A** | **D** | | | | | | | | |
| | | **RS-422 NMEA 0183 v3.0, 4800 baud, 8,N,1** | | **A** | **E** | | | | | | | | |
| | | *USB/RS-232, 1.4 m USB cable, ASCII auto, 19200 baud,8,N,1 (220782)* | | *A* | *F* | | | | | | | | $110 |
| | | *USB/RS-485, 1.4 m USB cable, ASCII polled, 19200 baud, 8,N,1 (220782)* | | *A* | *G* | | | | | | | | $110 |
| 4 | Enhancements | **None** | | | | **0** | | | | | | | |
| | | *Heating for wind and rain measurements* | | | | *1* | | | | | | | $90 |
| 5 | Connector | **No connector, bushing & grounding accessories** | | | | | **A** | | | | | | |
| | | *8-pin M12 male connector and bushing & grounding accessories* | | | | | *B* | | | | | | $55 |
| 6 | Cable | **No Cable** | | | | | | **A** | | | | | |
| | | *Shielded 2 mete rs long 8-pin M12 cable (222287)* | | | | | | *B* | | | | | $100 |
| | | *Shielded 10 meters long 8-pin M12 cable (222288)* | | | | | | *C* | | | | | $160 |
| | | *Shielded 40 meters long 14-pin cable, open end wires (217020)* | | | | | | *D* | | | | | $300 |
| | | *Shielded 10 meters long 8-pin M12 cable, connectors on both ends (215952)* | | | | | | *E* | | | | | $210 |
| 7 | Installation accessories | **None** | | | | | | | **0** | | | | |
| | | *Mounting kit improves classification from IP65 to IP66 (212792)* | | | | | | | *1* | | | | $90 |
| | | *Bird spike (212793)* | | | | | | | *2* | | | | $120 |
| | | *Mounting kit and Bird spike improves classification from IP65 to IP66 (212792+ 212793)* | | | | | | | *3* | | | | $200 |
| 8 | Supporting software | **None** | | | | | | | | **0** | | | |
| | | *Service Pack 2: Vaisala Configuration Tool for Windows, USB Service cable* | | | | | | | | *1* | | | $150 |
| 9 | Manual language | **No manual** | | | | | | | | | **A** | | |
| | | **English** | | | | | | | | | **B** | | |
| 10 | Packing | **Standard** | | | | | | | | | | **0** | |
| | | | | | | | | | | | | TOTAL | |
| | | | | | | | | | | | | QTY | |
| | | | | | | | | | | | | TOTAL VALUE | |

**Selections in bold are included in the prices of the basic versions.**
*Selections in italic are available at an extra price.*

Example of order code with typical settings:

| WXT520 | A | A | A | 0 | A | A | 1 | 1 | B | 0 |
|---|---|---|---|---|---|---|---|---|---|---|

**WXT520 Spare parts & Accessories**

| | | |
|---|---|---|
| 220614 | Service Pack 2: Vaisala Configuration Tool for Windows, USB Service cable | $180 |
| 218817SP | WXT520 Radiation shield set | $175 |
| WXTBOTTOMSP | WXT520 Bottom assembly (with BIF card, M12 connector, screws w. O-rings) | $200 |

**WXT510/520 Spare parts & Accessories**

| | | |
|---|---|---|
| 220782 | USB RS-232/485, 1.4 meters USB / M12 cable | $140 |
| 222287 | Shielded 2 meters long 8-pin M12 cable | $140 |
| 222288 | Shielded 10meters long 8-pin M12 cable | $210 |
| 217020 | Shielded 40 meters long 14-pin cable, open end wires | $400 |
| 215952 | 10 meters long 8-pin M12 cable, connectors on both ends | $270 |
| WXTPTUSP | WXT PTU module | $210 |
| 222109 | Bushing & grounding accessory kit | $30 |
| 212792 | Mounting kit (improves classification from IP65 to IP66) | $120 |
| WSP150 | Surge protector, no connectors | $300 |
| WSP152 | Surge protector for host PC (e.g. USB connection) inc. M12 connectors. Suitable with 220782 and 215952. | $350 |
| 212793 | Bird kit | $140 |

**WXT510 Spare parts & Accessories**

| | | |
|---|---|---|
| 215194 | Service Pack 1: Vaisala Configuration Tool, Weather Measurements (software and RS-232 WXT510 service cable) | $90 |
| 221523 | M8 adapter to WXT510 Service connector (use with Service pack 2) | $60 |

**WA15 Wind Set**

| | | | | | 1 | 2 | 3 | |
|---|---|---|---|---|---|---|---|---|
| **Vaisala Wind Measurement Set** | | | | **WA15** | | | | **PRICE** |
| 1 | **Sensors** | | **no sensors** | | **A** | | | |
| | | | *wind speed sensor WAA151 only* | | *B* | | | $550 |
| | | | *wind direction sensor WAV151 only* | | *C* | | | $590 |
| | | | *wind speed and direction sensors WAA151 and WAV151* | | *D* | | | $1,130 |
| 2 | **Accessories** | Crossarm or transmitter and cable | **no crossarm or wind transmitter** | | | **1** | | |
| | | | *crossarm with termination box WAC151* | *(signal pass-through)* | | *2* | | $440 |
| | | | *crossarm with termination box WAC151, 16-lead signal cable* | | | *3* | | $560 |
| | | | *crossarm with termination box WAC151, 6-lead power cable* | | | *4* | | $560 |
| | | | *crossarm with termination box WAC151, 16-lead signal and 6-lead power cable* | | | *5* | | $650 |
| | | | *crossarm and analog transmitter WAT12* | *(current loop output)* | | *6* | | $730 |
| | | | *crossarm and analog transmitter WAT12, 6-lead cable for signal and power* | | | *7* | | $810 |
| | | | *Crossarm and serial RS-485 transmitter WAC155* | *(WAC155)* | | *8* | | $790 |
| | | | *Serial RS-485 transmitter WAC155CB card only* | *(WAC155B)* | | *9* | | $260 |
| 3 | | Power supply | **no power supply** | | | | **A** | |
| | | | *power supply WHP151* | | | | *B* | $580 |
| | | | | | | | TOTAL | |
| | | | | | | | QTY | |
| | | | | | | | TOTAL VALUE | |

**Selections in bold text are included in the price of basic version.**

*Selections in italic are available at extra cost.*

Shaded sections indicate typical selections.

Example of order code with typical settings:

| | | | | |
|---|---|---|---|---|
| **WA15** | **D** | **5** | **B** |

| Accessories and Spare Parts: Description | Order Code | PRICE |
|---|---|---|
| Set of bearings and gasket | 16644WA | $45 |
| Cup assembly | 7150WA | $60 |
| Thermostat Switch Option (not included in AWAT12 if ordered separately) | 16923WA | $70 |
| Connector WAA151, WAA252 | 1394 | $35 |
| Connector WAV151, WAV252 | 1395 | $35 |
| Outdoor Signal Cable for WA-sensor, 10m (16-lead) | ZZ45048 | $125 |
| Outdoor Heating Power Cable, 10m (6-lead) | ZZ45049 | $85 |
| Vaisala Surge Protector | WSP150 | $300 |



## HUMIDITY AND TEMPERATURE INSTRUMENTS

**Portables:**

| | | |
|---|---|---|
| HM34 | Pocket-size relative humidity and temperature meter…….. | $535 |

**Duct and Wall Mount:**

| | | |
|---|---|---|
| HMD60Y | Humidity and temperature 2-wire transmitter for duct mounting, 4 to 20 mA outputs…. | $525 |
| HMD60U | Humidity transmitter for duct mounting; same as HMD60Y but humidity only…… | $420 |
| HMW60Y | Humidity and temperature 2-wire transmitter for wall mounting, 4 to 20 mA outputs…. | $480 |
| HMW60U | Humidity transmitter for wall mounting; same as HMW 60Y but humidity only…….. | $360 |
| HMD70Y | Humidity and temperature 3-wire transmitter for duct mounting with voltage outputs… | $525 |
| HMD70U | Humidity transmitter for duct mounting; same as HMD70Y, but humidity only……. | $420 |
| HMW70Y | Humidity and temperature transmitter for wall mounting with voltage outputs…… | $480 |
| HMW70U | Humidity transmitter for wall mounting; same as HMW70Y but humidity only…… | $360 |

**Temperature-Only:**

| | | |
|---|---|---|
| HMD60T | Temperature two-wire transmitter for duct mounting, 4 to 20mA outputs…… | $410 |
| HMW60T | Temperature two-wire transmitter for wall mounting, 4 to 20 mA outputs…… | $360 |
| HMD70T | Temperature three-wire transmitter for duct mounting with voltage outputs…… | $440 |
| HMW70T | Temperature three-wire transmitter for wall mounting with voltage outputs…… | $360 |

**Outdoor Use:**

| | | |
|---|---|---|
| HMD60YO | Humidity and temperature 2-wire transmitter for use outdoors 4 to 20 mA outputs. ….. | $760 |
| HMD60UO | Humidity 2-wire transmitter for use outdoors; same as HMD60YO but humidity only… | $640 |
| HMD70YO | Humidity and temperature 3-wire transmitter for use outdoors with voltage outputs…. | $840 |
| HMD70UO | Humidity 3-wire transmitter for use outdoors. Same as HMD70YO, but humidity only.. | $670 |

**Calibration-Free:**

| | | |
|---|---|---|
| HMD40Y | Humidity and temperature 2-wire transmitter for duct mounting, 4 to 20 mA outputs…. | $260 |
| HMD40U | Humidity transmitter for duct mounting: same as HMD40Y, but humidity only……. | $190 |
| HMW40Y | Humidity and temperature 2-wire transmitter for wall mounting, 4 to 20 mA outputs…. | $240 |
| HMW40U | Humidity transmitter for wall mounting; same as HMW40Y, but humidity only……. | $180 |
| HMD50Y | Humidity and temperature 3-wire transmitter for duct mounting with voltage outputs. .. | $260 |
| HMD50U | Humidity transmitter for duct mounting; same as HMD50Y, but humidity only……. | $190 |
| HMW50Y | Humidity and temperature 3-wire transmitter for wall mounting with voltage outputs…. | $240 |
| HMW50U | Humidity transmitter for wall mounting; same as HMW 50Y, but humidity only…….. | $180 |

## SOLAR RADIATION AND PRECIPITATION SHIELDS

| | | |
|---|---|---|
| DTR503A | Solar radiation and precipitation shield, 12 plate…….. | $310 |
| DTR502B | Solar radiation and precipitation shield, 9 plate…….. | $310 |

**HMT300TMK for Power Turbine**
Complete Solutions Consists of:
Transmitter: HMT3307S0C021XXAA200F0EAABAA1
X = -49 to 167°F dewpoint
Installation Kit: HMT300TMK1B1
Total Price: $3985

**CARBON DIOXIDE ($CO_2$) INSTRUMENTS**

| | | |
|---|---|---|
| GMD20 | Carbon dioxide transmitter for duct mounting | $360 |
| GMD20D | Same as GMD20 plus local display and relay | $410 |
| GMW21 | Carbon dioxide transmitter for wall mounting | $330 |
| GMW21D | Same as GMW21 plus local display and relay | $380 |
| GMA20T | Analog temperature option for GMW21 with 0 to 10V output | $60 |
| GMI21 | Local display and relay option for GM20 series transmitters | $80 |
| GMR20 | Relay option for GM20 series transmitters | $60 |
| 19040GM | Serial COM adapter for calibrating GM20 series transmitters | $100 |
| GML20 | Lonworks module for GM20 series transmitters | $170 |
| GML20T | Lonworks module including temperature for GMW21 | $240 |
| GMW115 | Carbon dioxide transmitter for wall mounting | $300 |

**STATIC PRESSURE HEADS**

| | | |
|---|---|---|
| SPH10 | Static pressure head | $270 |
| SPH20 | Static pressure head, heated | $820 |

**OEM Products, Call 1-888-VAISALA (824-7252) for pricing**

| | |
|---|---|
| HMM210 | Humidity modules for environmental chambers. |
| HMM100 | Humidity modules for environmental chambers. |
| HMT310 | Humidity and temperature transmitters with small size and 6 probe choices. |
| DMT142 | Miniature dewpoint transmitter. |
| MMT310 | Moisture and temperature transmitters for oil. |
| MMT162 | Compact moisture in oil and temperature transmitter. |
| GMM111 | Carbon dioxide module with 0-5, 0-10 and 0-20% measuring ranges. |
| GMM112 | Carbon dioxide module for HVAC applications. |
| GMM20W | Carbon dioxide module. |
| GMM220 | Carbon dioxide module for demanding applications. |



# Vaisala Contact Information

## EUROPE

### FINLAND
Vaisala Oyj
P.O.Box 26
FI-00421 Helsinki
FINLAND
Tel. +358 9 894 91
Fax +358 9 8949 2485
sales@vaisala.com
www.vaisala.com

### BENELUX
Contact: Bonn Office
Adenauerallee 15
D-53111 Bonn
GERMANY
Tel. +49 228 24971 23
Fax +49 228 24971 11
Toll free Netherlands :
00800 -282 472 52
Toll free Belgium:
0800 17 200
benelux.sales@vaisala.com
www.vaisala.nl
www.vaisala.be

### FRANCE
Vaisala SAS
Marseille Office
2, rue de Beausset
F-13001 Marseille
FRANCE
Tel. +33 4 88 66 17 51
N° Vert
+ 0800 67 67 26
ventes@vaisala.com
www.vaisala.fr

Vaisala SAS
Paris Office
2, rue Stéphenson
F-78181
Saint-Quentin-en-Yvelines
Cedex
FRANCE
Tel. +33 1 3057 7342
Fax. +33 1 3096 0858
N° Vert
+ 0800 67 67 26
ventes@vaisala.com
www.vaisala.fr

### GERMANY
Vaisala GmbH
Bonn Office
Adenauerallee 15
D-53111 Bonn
GERMANY
Tel. +49 228 24971 0
Fax. +49 228 24971 11
National: 0800VAISALA
vertrieb@vaisala.com
www.vaisala.de

Vaisala GmbH
Hamburg Office
Schnackenburgallee 41D
D-22525 Hamburg
GERMANY
Tel. +49 40 8390 3160
Fax. +49 40 8390 3110
National: 0800VAISALA
vertrieb@vaisala.com
www.vaisala.de

Vaisala GmbH
Uhingen Office
Bahnhofstraße 3
D-73066 Uhingen
GERMANY
Tel. +49 7161 65494 40
Fax. +49 7161 65494 50
National: 0800VAISALA
vertrieb@vaisala.com
www.vaisala.de

### SWEDEN
Vaisala Oyj
Malmö Office
Drottninggatan 1 D
S-212 11 Malmö
SWEDEN
Tel. +46 40 298 991
Fax +46 40 298 992
National (tel.): 0200 848 848
National (fax.): 0200 849 849
forsaljning@vaisala.com
www.vaisala.se

Vaisala Oyj
Stockholm Office
Johanneslundsvägen 2
S-194 61 Upplands Väsby
SWEDEN
Tel. +46 8 750 94 20
Fax. +46 200 8490 849
National (tel.): 0200 848 848
National (fax.): 0200 849 849
forsaljning@vaisala.com
www.vaisala.se

### SWITZERLAND
Contact: Bonn Office
Adenauerallee 15
D-53111 Bonn
GERMANY
Tel. +49 228 24971 0
Fax. +49 228 24971 11
vertrieb@vaisala.com
www.vaisala.de

### UNITED KINGDOM
Vaisala Ltd
Birmingham Office
Vaisala House
349 Bristol Road
Birmingham B5 7SW
UNITED KINGDOM
Tel. +44 121 683 1257
Fax +44 1638 576 240
uksales@vaisala.com
www.vaisala.com

Vaisala Ltd
Newmarket Office
Unit 9,
Swan Lane
Exning
Newmarket
Suffolk CB8 7FN
UNITED KINGDOM
Tel. +44 1638 576 200
Fax +44 1638 576 240
uksales@vaisala.com
www.vaisala.com

## NORTH AMERICA
Vaisala Inc.
Boston Office
10-D Gill Street
Woburn, MA 01801
USA
Tel. +1 781 933 4500
Toll free 1-888-VAISALA
(824-7252)
Fax. +1 781 933 8029
instruments@vaisala.com
www.vaisala.com

## ASIA AND PACIFIC

### AUSTRALIA
Vaisala Pty Ltd
Melbourne Office
3 Guest Street
Hawthorn, VIC 3122
AUSTRALIA
Tel: +61 3 9815 6700
Fax: +61 3 9815 6799
Freecall: 1800 335 840
sales.melbourne@
vaisala.com
www.vaisala.com

### CHINA
Vaisala China Ltd
Beijing Office
Floor 2, EAS Building
No.21, Xiao Yun Road,
Dongsanhuan Beilu
CHINA
Tel. +86 10 85261199
Fax. +86 10 85261155
chinasales@vaisala.com
cn.vaisala.com

### JAPAN
Vaisala KK
Tokyo Office
42 Kagurazaka 6-Chome
Shinjuku-Ku
Tokyo 162-0825
JAPAN
Tel. + 81 3 3266 9611
Fax. + 81 3 3266 9610
sales.japan@vaisala.com
www.vaisala.co.jp

www.vaisala.com

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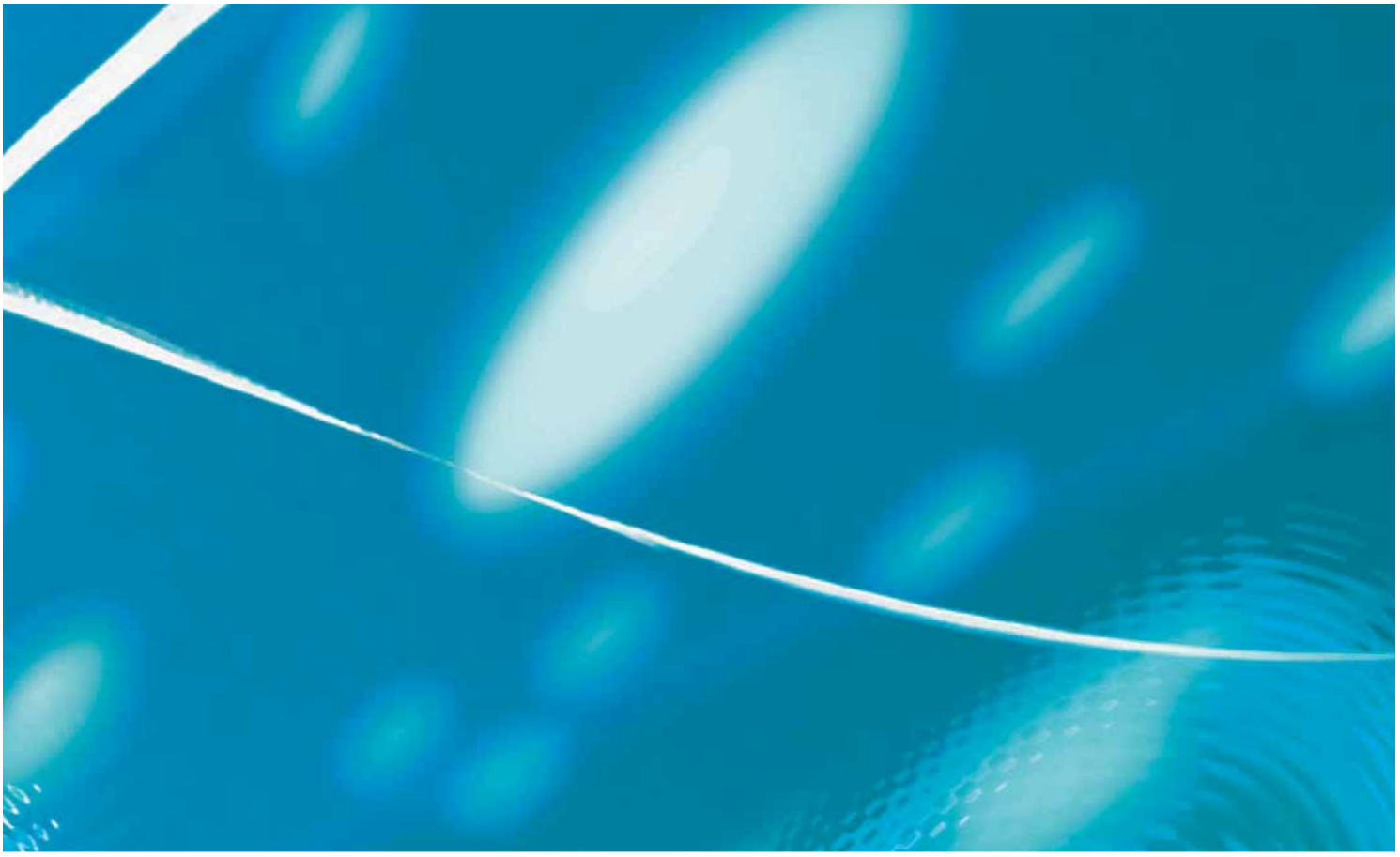

VAISALA

www.vaisala.com

For more information, visit
www.vaisala.com or contact
us at sales@vaisala.com

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